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EDITORIALS

Foreigners Seek American Rubber Scrap

MOST of the tire casings and inner tubes discarded in the United States will probably continue for a long time to go to American plants to make up the constantly increasing volume of reclaimed rubber, of which over $30,000,000 worth, or over 164,000 tons, was made in this country in 1926, equaling 45 per cent of the crude rubber consumed and 24 per cent more than the total reclaim used in 1925. But it is a fact, seemingly little realized, that foreign reclaiming plants are becoming increasingly eager for American rubber scrap and have been able to absorb a considerable amount without unduly augmenting the price. They know that a very large amount from this source will always be available. A country with 22,500,000 motor vehicles, and more coming all the time, cannot fail to provide a great store of material, even though with the aid of retreaders and others there will be much tire conservation.

Foreign reclaimers note, too, that American reclaimers have so improved the quality of their products as to make them serviceable even for 15,000-mile casings and also for surprisingly good inner tubes; and they, too, are striving constantly to better their material so that the brands, "Made in Germany" or "Made in Japan," will appear not merely on cheap mechanicals but also on rubber manufactures that will vie with excellent American products even though made mostly of reclaim from castoff American rubber goods.

While considerable rubber scrap is shipped abroad from Atlantic ports, it is on the Pacific Coast that rubber scrap exports have been showing the greater percentage of increase; and no small part of the 20,000 tons and more of old rubber picked up between San Diego and Seattle now finds its ultimate resting places in Hamburg, Tokio, and other distant points. Scarcely five years ago when raw rubber was very cheap old casings were such a drug on the market that junk men ceased to gather them. To clear their yards for more profitable material, Los Angeles dealers in waste took several thousand old tires to vacant ground outside the city, and the bonfire that they made caused more smoke than a dozen burning oil wells. But they are not burning any now. Even though prices paid for old casings may be much lower on the Pacific Coast than on the Atlantic seaboard, junkmen make much money by gathering them for the big dealers. In the Southwest the latter have been selling casings for around $14, with tubes about $130, and clean (iron-free) solid tires for $22 a ton, f. o. b.

Germany takes not only a big amount of old casings but also provides a good market for old tubes, reclaimers there regarding the ocean freight rate of $10 a ton via the Panama Canal as quite reasonable. This compares with an overland freight rate on old casings of $15 a ton from the Pacific Coast to Akron. Recently shipments of old tubes to Hamburg have been averaging over 100 tons a month, with nearly as much in old casings. Japan is also bidding strongly for old casings and tubes, and Pacific Coast shipments to the rubber factories of Tokio, continue to mount.

Old rubber footwear suitable for making auto top material is collected cheaply enough on the Pacific Coast to make it profitable to ship it via Panama to Boston. Not much is said to go abroad. Some old hose is exported, but very little hard rubber scrap; while miscellaneous mechanical rubber goods are not worth yard room on account of their low value.

Cooperating to Avoid Loss

IF, as was asserted in court recently, one tire company in cutting prices unnecessarily took a loss of $15,000,000, how great must have been the total loss of all the others who felt they had to follow suit? The pity is that the tremendous setback might have been all avoided had there been a better understanding among rubber manufacturers. They do not make enough money in the best of times. The producer of basic material for over four years has been getting a good profit; in scarcely six years tires have dropped over half in price and buyers are getting three times as much mileage; while users of countless other rubber articles are also getting more value and durability for a dollar than ever before.

Serving between the two great classes, the average rubber manufacturer has had to be content, even in the best seasons, with but a modest return on his investment. Few are able to acquire a fair reserve to tide them over the inevitable rainy day. Perhaps the effective solving of the major problems of the rubber industry can only be accomplished through some gigantic combination with a counterpart of the United States Steel Corporation dominating the situation. Meanwhile, however, wide swings can surely be controlled and huge losses may be averted through such simple means as horse sense and cooperation. Frank, frequent conference on vital trade affairs is not incompatible with wholesome competition.

* * *

SOME READERS KINDLY SAY THAT THEY LIKE THE TERM "rubberware" sponsored by this journal as filling a real need. The desirability of some such brief, generic, comprehensive expression for rubber merchandise has long been felt, and rubberware would appear to have as much lexicon warrant as tinware, hardware, and similar words.

Mechanical Rubber Goods Laboratory

Outstanding Example of Scientific Control in Rubber Manufacturing—
Equipment for Chemical and Physical Testing and Research—
Typical Practical Results Illustrated in Belting,
Hose and Packing Manufacture

ALMOST interesting and important example of a modern chemical and physical laboratory for rubber works' control and research is that recently built and equipped by The Manhattan Rubber Manufacturing Co., Passaic, New Jersey. It is a 2-story brick fire-proof building, 75 by 120 feet, daylight construction for admission of light and air on all sides. The operating personnel comprises 30 engineers, chemists, compounders and inspectors under the direction of Walter L. Sturtevant, chemical engineer, assisted by Kenneth J. Soule, assistant director. Each department is in charge of a chemical engineering specialist.

The work of the laboratory comprises two general divisions; control of factory processes and materials, and research and development of products. Both divisions are highly important for they include the detailed study of materials, construction, processes and determination of the factors that make for dependability of the company's products in service.

The service required of rubber goods for mechanical purposes is chiefly of an engineering sort. This means strict conformity to specifications must be maintained in the materials and construction of the products. A few outstanding examples which have been developed and continue under laboratory control are: automobile brake linings, friction surface transmission belting, rubber covered press rolls, conveyer belting for ore, coal, etc.; hose for fire departments, steam, water, air, oil, vacuum and other services; floor tiling and numerous articles for special uses.

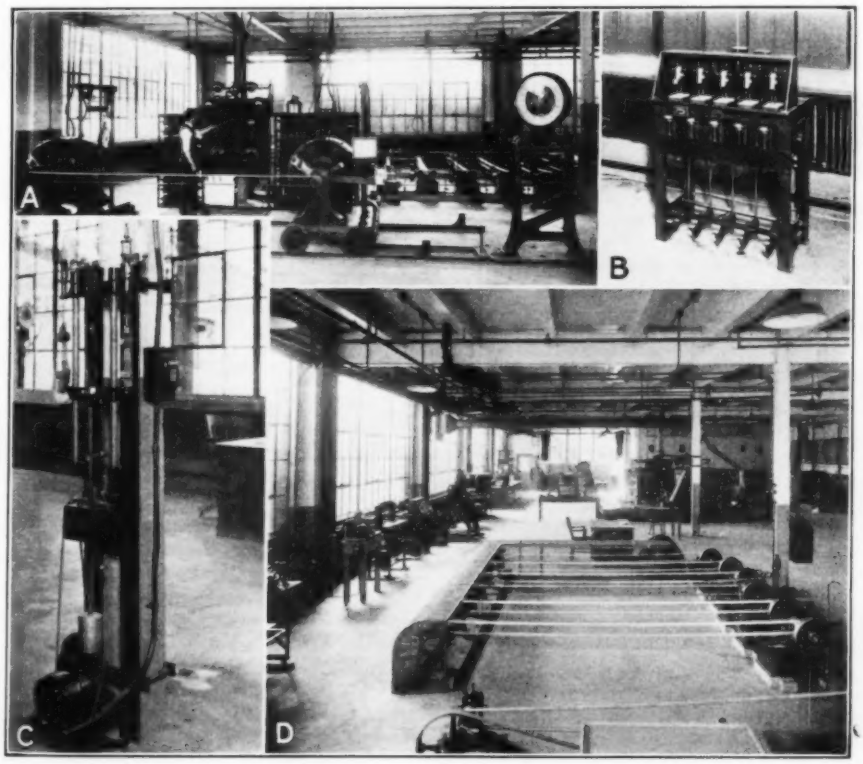
Laboratory Equipment

Glancing rapidly over the laboratory one finds the executive office a spacious well-lighted room containing facilities for conducting the business incidental to the laboratory operation and the compilation of records and reports. Adjoining the office is the library and conference room, containing a technical library and cases for exhibiting samples of the company's products. A most effective exhibit in this room is the rubber tiled floor done in colors harmonizing with the hard wood finish of the walls.

Chemical Laboratories

The analytical laboratory for control analyses of rubber, compounding ingredients, and other supplies occupies about 24 by 40 feet. The hoods, bench tops, shelving and sink are of natural stone to prevent damage by acid corrosion or fire. The table for analytic work stands in the center of the room. The hoods are piped with steam, air and gas. Special power ventilation removes both heavy and light fumes as rapidly as developed in the work.

The chemical research laboratory is apart from the analytical room. It is fitted with every essential in the way of supplies and apparatus and in addition contains a motor driven experimental mixing mill and a hydraulic steam platen curing press. The facilities of this department are self contained and independent of all routine requirements.



Research and Control Laboratories of the Manhattan Rubber Manufacturing Co., Passaic, New Jersey.

A—ELECTRIC BELT DYNAMOMETER

B—BELT FLEXING MACHINE
C—AUTOGRAPHIC FRICTION MACHINE

D—GENERAL VIEW OF THE PHYSICAL LABORATORY

Textile Testing Laboratory

A room 20 by 20 feet with heat insulating double walls of cellular sheathing is set apart for fabric testing. The humidity is controlled by a humidifying machine which is set in operation 12 hours before the exposed textile samples are to be tested. The equipment includes a Scott autographic horizontal machine for determining breaking strengths of heavy cotton duck. Other testing apparatus include a reel for skeining yarn, skein tester, single strand yarn testers of two types beside many minor pieces of testing and measuring apparatus.

Compounding and Curing Facilities

An experimental mixing mill, and press facilities for curing samples in molds as well as in open steam are provided. This apparatus is in constant use preparing test samples for the production control work of the laboratory and the development of compounds to meet specification requirements.

Physical Testing Facilities

Detailed reference to the equipment and work of the physical testing section of the laboratory would exceed our limitations of space. Reference will therefore be made only to certain special equipment and some of the practical results attained by its use. The apparatus referred to includes the belt dynamometers, belt flexing machine, and autographic friction machine. Graphs are given to illustrate some practical results obtained by the use of these machines.

Electric Belting Dynamometer

The most efficient method of determining the life of rubber belting is by the dynamometer test. The apparatus used is a Sprague electric dynamometer and consists of two 100 h.p. motors, one acting as the motor or driver, and the other as the generator or absorption machine. The motor is fixed, but the absorption machine is movable. The tensions on the belt are obtained by means of a Toledo scale which is attached to the absorption machine.

The unit admits making two sorts of tests, one giving the characteristics of the belt and the other a life or service test. The first, or characteristic test, utilizes 24-inch pulleys, at a belt speed of 3,100 to 3,200 feet per minute. From this test is determined the horse power the belt will transmit, its efficiency, effective pull, tight and slack side tensions, sag of the belt, arc of contact, coefficient of friction and per cent of slip. A horse power slip curve, showing the type of results that may be obtained, is seen in Figure 1.

To determine the life of a belt very small pulleys are used with rapid speeds. This type of test will determine the efficiency of the friction compounds, the ability of the belt to hold fasteners, and the stretching qualities of the belt. Depending upon the rubber friction between the plies, some belts will last but 25 hours on the dynamometer, while others will run as long as 1,000 hours.

Multiple Dynamometer

A Sprague dynamometer will test but one unit of belt at one time and often the total hours required is considerable. To facilitate and cover a greater range of work a multiple dynamometer testing six belts at a time has been designed in the laboratory. The machine is so planned that one motor is directly connected to the driving shaft, which is continuous and mounts six 4-inch pulleys. The opposite side of the machine is made up of six individual Prony brakes. These brakes, which are pressed steel automobile drums, slide on guides and are on the same shaft as the other 4-inch pulleys. An ingenious mechanism enables one to apply the necessary tension to the belt, and it is a part of the secondary or Prony brake unit. This machine is used exclusively for service and factory control tests.

Autographic Friction Testing Machine

For years the standard of quality of a belting compound has been shown by the friction test. For want of a suitable recording machine the test has been made by means of the dead weight method. This method consists of hanging one ply on a hook or in a clamp and attaching to its adhering ply sufficient weights to cause separation at a definite rate per minute. At best this method is crude because of the great variability of the human element. When the test is finished there is no permanent record except the figure the operator jots down. To eliminate this dependence on judgment, an autographic motor driven friction testing machine has been constructed. Its principle is the application of a load to a calibrated spring, at a definite rate of speed. A Crosby steam indicator without its piston is mounted upon supports at the top of the machine. An eccentric jaw is attached to the indicator spring by means of a chain. Directly below the upper jaw, another one is fastened to a movable arm. In this machine the standard Scott yarn machine transmission box is utilized. A rack directly connects the movable arm mentioned to the transmission box and moves at a speed separating the plies of the test sample at a rate of one inch per minute. Around the indicator drum is placed a curve sheet ruled to the calibration of the indicator spring. The line drawn by the pen shows the behavior of the friction compound during test. It also shows at a glance the variations of the friction grip of the samples. See Figures 2 and 3.

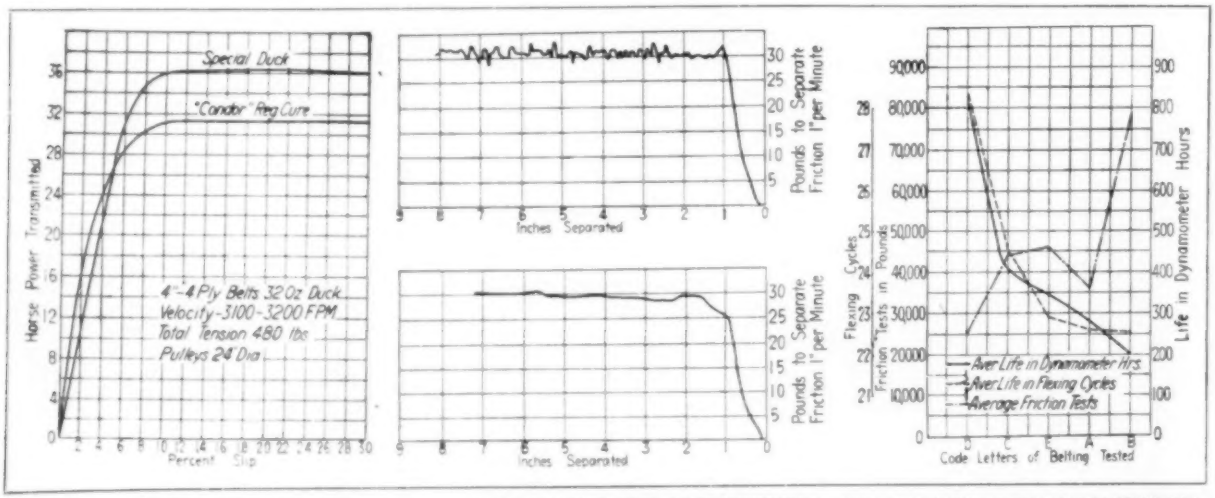


FIG. 1. HORSE POWER SLIP OF BELTING.

FIG. 2. UPPER-FRICTION TEST OF TRANSMISSION BELTING.

FIG. 3. LOWER-FRICTION TEST OF STEAM HOSE.

FIG. 4. BELTING LIFE BY DYNAMOMETER, FLEXING AND FRICTION TESTS.

Flexing Machine

The dynamometer test, although it is accelerated, is the nearest approach to actual service tests of belting. However, the long time necessary to complete some of the dynamometer tests led to a search for one more accelerated. The general laboratories of the United States Rubber Co. and the American Society for Testing Materials developed the flexing machine, the function of which is the same as the dynamometer test, namely, to separate the plies of a belt.

The test consists in drawing a 1 x 8 inch sample of belting under a definite load back and forth over a pulley 1¼ inch in diameter. A complete cycle is recorded on a Veeder counter. The samples under test are enclosed in a chamber, to insure constant temperature. The machine operates at about 160 cycles per minute. The test is complete when there is a separation of the ply completely across the sample.

Flexing and Friction Tests of Belting

For years, and for want of a better method, the friction test has been the standard laboratory test for belting. Millions of feet of conveyer and transmission belting have been sold on the basis of its friction test. It was accepted for a long time, but gradually it is being replaced by more scientific methods of approaching service test results.

The friction test breaks down immediately the friction compound between the plies. Sometimes if a compound has good adhering properties the friction test is a typical tensile test and failure occurs in the compound itself, thereby leaving rubber fastened to both separated plies. At another time the test actually determines how well a friction compound adheres to the fabric.

The dynamometer test is an exact duplication of service conditions and if the laboratory is possessor of a dynamometer it can obtain results in a very short time that will check very closely those obtained in service. The dynamometer, being a very flexible machine, can duplicate the most extreme cases of very light service or very severe service. Although the dynamometer appears to be very heavy and cumbersome, it lends itself to very fine adjustments, and because of its nature, it can be manipulated to reproduce actual service conditions.

Although a great deal of work has been accomplished with the flexing machine, it cannot yet be said that the test duplicates service conditions. The average transmission belt sample will fail in less than one day on the flexing machine, and this fact makes it a desirable method of test. Flexing failure is much accelerated over actual service, or the dynamometer test, yet it is gradual failure, and this makes it a more reliable test than the friction test.

The friction test is gradually declining in favor with the rubber belting manufacturer, and is being replaced by dynamometer, pulley or flexing tests. Laboratory data point to the unreliability of the friction test as a means of determining the life of a belt. As an example Figure 4 shows a series of belts tested for friction, flexing and dynamometer. It will be noted that high friction tests do not indicate a high dynamometer or flexing test, neither do low friction tests indicate a low dynamometer or flexing. It will be seen, however, that the flexing and dynamometer curves are concordant, and since the dynamometer test is a duplicate of service tests, the belief is becoming established that dynamometer and flexing tests are equivalent and closely indicate belting life under service conditions.

It is necessary only to mention that this laboratory contains all the standard testing equipment found in the best testing laboratories and that its work has resulted in the development of the company's products to the foremost rank of quality and service.

The laboratory operating staff is fortunate in possessing this remarkably complete installation of mechanical and scientific facilities for research and routine testing control. It is fresh evidence of the progressive spirit of President Arthur H. Townsend and the management that maintains this company in the forefront of the mechanical rubber goods industry.

Balloon Tires Not the Cause of Wheel Shimmy

One of the chief arguments advanced against the balloon tire when it first made its appearance in the summer of 1923 was that it caused wheel shimmy. There was some basis for this belief, in the case of some of the models of automobiles which were equipped with balloons early in the game. The trouble was due largely to a wheel of too small diameter and a four-ply balloon. With the advent of the six-ply balloon on the larger sizes, flat surface tread designs, and more intelligent study of the tire requirements of the various models, these early troubles have been eliminated, and it can be said with assurance that wheel shimmy today is not due to the tire.

This was brought out in a lengthy discussion recently among automobile and tire engineers at a meeting of the Society of Automotive Engineers. It was pointed out that shimmy existed long before the advent of the balloon tire and that many cars equipped with balloon tires do not shimmy.

Johannes Plum of the Royal Danish Legation in a paper, "Why Does a Car Pivot?" traced the manner in which a skid is developed. He concluded that in the end it is necessary to design a four-wheel brake system which combines two methods of braking, for wet and dry weather respectively. Because a car with revolving wheels is never traveling continuously for any length of time in a mathematically straight course, a car is always under the influence of a transverse force. As long as the wheels are revolving they possess a "sense of direction" which resists the transverse force, and enables the car to be steered. Consequently it is undesirable to lock any set of wheels under any condition. But when a set of wheels lock, they instantaneously cease to function as wheels, and the car is to all intents and purposes mounted on rubber covered stilts, which move in whatever direction the forces acting upon them may cause them to move.

K. L. Hermann presented a paper, "Causes of Wheel Shimmy," which in the last analysis tended to throw the burden of shimmy troubles on tires and tire manufacturers. This brought an immediate reply from Burgess Darrow of the Goodyear Tire & Rubber Co.

His denial of the tire's sole responsibility was sweeping and general and also specific with regard to the six major points of Mr. Hermann's paper.

After tracing effects of caster, camber and toe-in on shimmy, as based on the results of a long series of tests, Mr. Hermann also dealt with the effects of wheel assembly balance, air pressure, radial run-out, side run-out and uniformity of tread thickness. Finally he arrived at the conclusion that the tire is the major offender as regards shimmy, and that much of this fault lies with the rubber companies. In refutation of the evils charged to the rubber companies, Mr. Darrow issued a blanket invitation to automotive engineers to visit his laboratories and compare apparatus and equipment with that of the other industry in the light of the essentially different nature of the two products. Mr. Darrow also emphasized the elastic suspension theory and the general good commercial balance of tires.

In a sense his comment was confirmed by two or three other speakers, who dealt with the practical and theoretical aspects of the shimmy question.

GAIN IN AMERICAN TIRE EXPORTS

According to statistics prepared by the Department of Commerce, the exports from the United States of all classes of rubber goods have risen from a value for 1924 of $40,621,595 to $60,051,332 for 1926. Tabulations also show that during these three years the shipments of automotive rubber goods have advanced from $20,822,186 to $33,173,896, or a gain over the 1925 figures of 14 per cent. In general, however, the gains registered for 1926 represented not volume increases but value gains, while in 1925 there were advances in both volume and values.

Drop Center Balloon Tires

Colin Macbeth

THE American tire user has been wedded for many years to the demountable rim, irrespective of the method of tire bead construction. The detachable wheel has never really taken hold in the United States though there has been no lack of capable exponents in the manufacture and sale of such equipment. Today we see a great increase in the use of detachable equipment and it is as well to analyze the reasons for its increased popularity.

The use of the balloon tire has accentuated troubles which have been always there when using demountable rims due to lack of alinement, eccentricity, poor balancing, excessive peripheral weight and undue cost. The flood of technical comment on "shimmying" troubles, "tramping" action, etc., and the remedies for these ills have all pointed to the fact that the causes of these troubles should be eliminated.

The use of small diameter wheels has inevitably forced designers to choose one only of the previous two types of tire mounting; that is, to cease to use both a permanent wheel attachment at the hub and a detachable rim at the periphery. It has been patent to all wheel men that small diameter wheels can only be made to compete today and having one point of attachment which shall be both permanent or demountable at will. On this basis the hub attachment wins every time in lightness, cost, true running and balance.

In four years' time the use of front wheel brakes can be said to be universal except on the cheapest cars, and as far as Europe is concerned on all grades of cars. Their accommodation calls for great compactness when used in conjunction with small diameter wheels and balloon tires, and with the best type of brakes—the internal expanding type—the larger diameter of drums together with center point steering knuckles means that front wheels are necessarily dished or off-set. This again calls for steel disk or wire wheels and is all against the continued use of wood spoke wheels.

Having thus summarized the accepted best modern practice I come to the point of perhaps greatest interest to the American user today. Is the drop base balloon tire going to become the American standard, and if it is, will it be on small wheel diameters? In my view, yes, because the "survival of the fittest" is as great a law in the automobile business as in nature itself.

The balloon tire is most needed on small cars for the reason that these cars use the same roads and encounter the same stones, ruts and gullies as the large cars. The small car tire section will inevitably tend to rebound to a greater extent than the large car tires will, just because road roughnesses are felt more by the small car passenger and he depends on tire absorption to a greater extent. Also we know that the small car of light construction and small wheel base can get less help from its springs than can the big car.

When balloon tires came first into use they were of larger section than is general today and gave troubles which were, in my opinion, largely due to the adoption of narrow rims. Consequently there was a grading down of tire sections. I believe that the full balloon tire will come back on all sizes of car, but more on the small cars than the large as the small fellow needs them most.

Will the drop base rim predominate? Yes, it decidedly will, in my view. We see today that Ford has adopted this rim on all closed cars, and why? Because it is simple, cheap, rustproof, flapless, balanced, true running, light and very handy. When a conservative country like Great Britain is offered a choice between flat straight side rims, clincher rims, and an entirely new departure like balloons or drop center rims, and goes solidly for the latter, it does not do it without good reason. It is true that such a move offered a chance of a new and simplified range and number of rims and tire sizes, but it meant a great outlay to reach that goal which in fact is not yet arrived at.

Remember that the drop base rim as in general use in Great Britain and the Dominions today has the standardized "valve at an angle," which means only one size of motor tire valve for all passenger cars. Think what that would mean to tire and tube manufacturers and agents in the States today! Mr. Hoover would count the millions saved annually, and the valve manufacturer would benefit tremendously and be able to reduce valve prices. Drop base rims can be and are mounted on wood, wire and disk wheels and their few diameters all tend to simplify wheel manufacture.

This year Rudge Whitworth markets a wire wheel with the wires attached to the outer bead seat, thus allowing the tire bead to become the water seal, thereby making a wire wheel water tight at the spoke holes. When so arranged this wheel allows ample offset in order to give center point steering with front wheel enclosed brakes.

International standardization of drop base rims will not be difficult as flange heights and distances between flanges are identical on British standard drop base rims, and S. A. E. straight side rims. Therefore tires made for one rim will fit on the other. There is some confusion caused by the use of the name "Drop Center Rim" in the United States, and "Well Base Rim" in Great Britain, but they are one and the same type of rim.

Three years ago it was thought in England that 20-inch was the smallest diameter rim that would be popular, but at that time the writer advocated an 18-inch diameter for the small cars and today they are produced on a big scale. There is sound argument for thinking that rim diameters will go to 16-inch before long in combination with 25-inch diameter tires. Such a combination will enable the quick revolution engine to be used to a greater extent and will improve the acceleration of the automobile very materially. As engines are built to run regularly at high revolutions, so must the chassis designer arrange his transmission system to be as direct as possible in order to get high efficiency on top gear. In effect the small diameter tire helps towards the non-use of the gear box except in emergencies.

The greatest obstacle in the way of smaller wheel diameters is brake drum interference. Thus with 16-inch bead seat diameters we will get, say 14¾-inch well diameters and, say 14½-inch inside the rims. The brake drum man wants bigger diameter drums. The tire man says drums must not overheat the tires. The big problem, therefore, will be to arrange good braking ability along with good heat dissipation and small bead diameters. This difficulty is already experienced on twin tired passenger coaches where the brake heat damages the inside tires. The use of single tires only and properly cooled brakes is necessary to get the full advantage of small diameter wheels.

It may be that my arguments as to the coming of the 18-inch and still more the 16-inch wheel will not be approved by American tire and car manufacturers. It is, however, evident that there is already a move in the United States towards the use of smaller cars. This is evidenced by the reception of the Overland Whippet, whose sales must already exceed 75,000 cars. It is in effect the 15 h. p. car which to the Englishman of 1912 represented the low-priced car. Today the utility car for the Britisher—the car that takes him to work and that the Missus and kids go shopping in, is the 11 h. p. car doing 35 miles to the gallon instead of 25 on the 15 h. p. car.

Rubber in Chemical Engineering

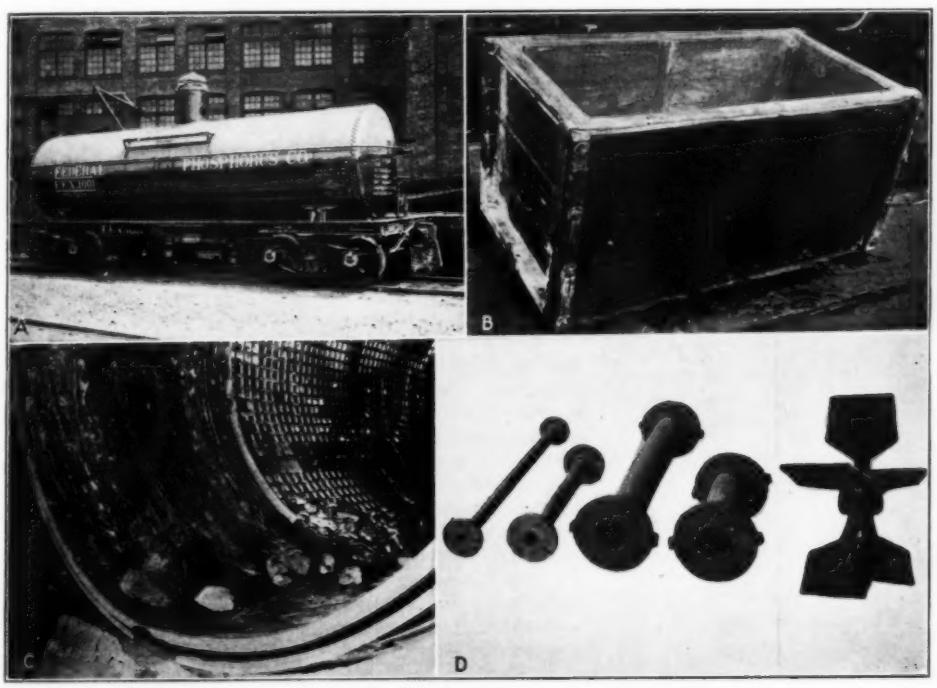
Anti-Abrasion and Anti-Corrosion Quality Developed and Applied by New Process of Uniting Soft Rubber to Metals, Wood and Concrete—Special Applications of Rubber in Mining, Transportation and Industry

H. E. Fritz,
Mechanical Sales Department, The B. F. Goodrich Rubber Co., Akron, Ohio

CORROSION and abrasion are two very important agencies of deterioration which occasion immense and continuous loss in industry, particularly in the operation and replacement of plant and equipment incidental to chemical engineering as applied to the process industries. In recent years increasing use has been made of rubber as a structural material in place of metals and evolved for attaching soft rubber direct to metal and has led to many unique adaptations of rubber.

The Vulcalock Process

The so-called Vulcalock process effects the attachment of soft rubber direct to metal and other rigid materials so thoroughly that



A—Rubber Lined Acid Tank Car. These Cars are used for Transporting Hydrochloric and Other Mineral Acids.

B—Wooden Tank Lined with Rubber. Used for Storage of Strong Acids and Corrosive Liquids.

C—Rubber Lined Gravel Screen for Grading Sand and Rock.

D—Pipes, Fittings and Fan, All Rubber Lined. Used for Conducting Acids, Corrosive Liquids and Gases.

wood. Vulcanized soft rubber has gained recognition rapidly as a structural material for similar uses. This has been possible because of the advancements in the technology of rubber whereby stocks are produced outclassing all the usual construction materials in practical utilities for withstanding difficult service. The value of rubber for many industrial purposes depends on the success with which it can be attached to metals so effectively as to make them practically integral at the union. The attachment of rubber to wood as in the case of lining tanks, etc., was not attempted until, by the development of low temperature accelerators of vulcanization, it became possible to cure rubber at the temperature of boiling water or even at room temperatures.

The utilization of hard rubber for articles of industrial utility is very old. The list of such applications would include pumps, piping, tanks and many utensils suitable for handling acids, dyes and caustic liquids. In the process of rubber covering paper press rolls and other rolls for industrial processes hard rubber is used as an intermediate binding layer between the body of the roll cover and the cast iron center. A different method, however, has been the union renders both materials practically integral and can be separated only by cutting. Thus a structural combination is produced which affords the anti-corrosive and wear resistance of the rubber with the structural adaptability of the rigid base. Adhesion tests of the Vulcalock bond show over 700 pounds per square inch. By the same process rubber can be attached successfully to brass, aluminum and other metals, also to concrete and wood. The attachment requires processing the metal surface and special preparation of the rubber stock in its uncured form. The pliable, semi-plastic gum is applied to the metal and cured in place. The remarkable adhesion is effected during the curing operation. The only limiting factor of the attachment is heat. At present its application cannot be conservatively recommended where the temperature exceeds 150 degrees F., except in very special cases.

Of the many new applications in which rubber figures as an anti-abrasive and anti-corrosive structural material some of the more striking are cited, indicating the industrial possibilities of this process and the use of low temperature accelerators which permit curing rubber under conditions otherwise impossible.

Rubber Resists Abrasion

The superior durability of tire treads as compared with steel is seen in the fact that chains on tires traveling over concrete and brick pavement wear very rapidly and are destroyed in a very limited mileage whereas the rubber tread shows no visible wear under the same conditions. Observation of this fact led a few years ago to the use of tire tread rubber as a lining for tubular grinding mills, and as the protecting cover of conveyer belting carrying sharp abrasive ore and rock.

Quoting actual tests in service of this sort, the shell of a 5 by 22 foot grinding mill in a cement plant charged with 45,000 pounds of steel balls was lined with rubber one inch thick made in flat sheets. After ninety days of continuous operation with 45,000 pounds of iron balls, inspection showed that the wear on the rubber was so slight that the cloth imprint remained on its surface. After 14 months of continuous service the sheets were calipered and at no place did the wear exceed 1/64-inch from the original thickness.

Bronze arms used in a carborundum mixer to eliminate a certain undesirable metallic contamination will give only six weeks' service. One such arm covered with ⅛-inch rubber was still in excellent condition after continuous service for more than ten months.

A sheet of rubber placed to receive the discharge of a dredge received for 7 months the impact and scouring action of 250,000 cubic yards of sand and gravel concentrated upon a small area. In this service the rubber outlasted 10 steel plates of the same thickness. Had the rubber been shifted to distribute the wear evenly upon its entire surface it could have given 40 times the wear that it did.

Rubber Bearings

The rubber bearing was developed primarily for sand and slime pumps in the mining field, but the application spread rapidly to the deep well pump and marine work. It is a well established fact that gritty materials will have no effect on either the shaft or bearing, providing there is sufficient water flowing over the bearing to properly lubricate it. The reason for this is that the soft smooth surface of the rubber will not permit particles of sand or grit to imbed themselves and consequently the particles roll to the helical groove cut through the bearing for the purpose of lubrication and are carried off by the flow of water. Water is to the rubber bearing what oil is to a babbitted or bronze bearing.

Bearings have been built and are operating in sizes from ½-inch in diameter up to 14⅝ inches either solid or in half shapes. They have recently been used for stern tube and strut bearings of vessels where bearings as large as 9¾ inches in diameter by 2 feet 9 inches in length are in satisfactory operation.

On long lines of vertical shafting, such as are used in deep well pumps, the natural whip of the shaft soon batters out bearings of bronze, babbitt, or other metals, even when accurately alined. This whip causes vibration which is transmitted along the entire shaft and is especially noticeable at the pump head. It is particularly severe when the bearings are worn. The resiliency of the rubber nullifies this vibration, and shafts with ordinary alinement operate with less vibration than bronze bearings-equipped shafts with the most exact alinement.

A Corrosion Resisting Material

Examples of the corrosion resisting applications of rubber are: The hard rubber jars containing electrolyte in accumulators, spinning bowls, bleach and dye rods, the soft rubber lining in wooden tanks for handling muriatic acid and soft rubber lined eggs for the same purpose, soft rubber lined steel tanks for dilute acids, salt brine, bleach liquids, soft rubber stoppers for sealing off fuming materials, etc.

The muriatic acid transportation problem has been almost completely solved by use of soft rubber lined tank cars and drums. Dilute acids such as sulphuric, hydrochloric, hydrobromic, hydrofluoric, phosphoric, sulphurous, as well as other corrosive chemical solutions can be readily handled and transported in rubber without appreciable effect on the material.

Some of the chemicals which can be advantageously handled in rubber lined equipment are listed in the following table.

	Per Cent Concentration by Weight	Maximum Degrees Temp. F.
Liquid Acids		
Hydrobromic	Concentrated	100
Hydrofluoric	Concentrated	150
Hydrofluosilicic	Any concentration	150
Muriatic (hydrochloric)	Concentrated	150
Phosphoric	Up to 75 percent	125
Sulphuric	Up to 50 percent	150
Carbonic	Any concentration	150
Pyroligneous	Any concentration	150
Sulphurous	Any concentration	150
Solutions		
Caustic soda and potash	Up to saturation	150
Calcium chloride	Up to saturation	150
Calcium hypochlorite	Up to saturation	100
Copper sulphate	Up to saturation	150
Sodium acid sulphate	Up to saturation	150
Milk of lime	Any concentration	125
Zinc chloride	50 percent	100
Aqua ammonia	Any concentration	125
Ferrous sulphate	Saturation	150
Sodium chloride	Saturation	150
Zinc sulphate	Saturation	150
Aluminum sulphate (alum)	Saturation	150
Organic Liquids		
Acetone		130
Ethyl alcohol	Any concentration	140
Methyl alcohol	Any concentration	150

Rubber Lined Tank Cars

For many years the generally accepted equipment for muriatic acid storage has been the wood tank lined with unvulcanized fine Para rubber. The use of the new process in attaching vulcanized rubber to the inside of steel tanks offers a durable substitute for wood equipment and makes it possible to discharge the contents by air pressure.

Standard steel tanks for the transportation of muriatic acid and other corrosives can be lined with vulcanized rubber with adhesion secure enough to easily guard against the rough usage to which the car is subjected. Twenty or more cars have been lined by this process during the past two years with uniformly satisfactory results. The oldest car is still in service with no signs of deterioration.

Other industrial applications of rubber by this new process include a full assortment of steel pipe and fittings lined with either hard or soft rubber attached inseparably to the steel. Similarly rubber sheet metal is now produced as readily workable as plain sheet metal itself in that it can be cut, bent and riveted into desired shapes. Rubber covered sheet metal is particularly valuable for flues conveying gases contaminated with gritty material, cement dust or corrosive acids. Other anticorrosive applications include lining fans and pumps, centrifugal machines, mixers, acid eggs, thickeners, agitators, vats, bins and many other pieces of chemical equipment.

AUTOMOBILES AS CONSUMERS OF COTTON

An enormous amount of cotton is required annually in the production of American automobiles, according to figures estimated by the Association of Cotton Textile Merchants of New York, the findings being based on statistics prepared by the National Automobile Chamber of Commerce. For example, more than 226,000,000 square yards of tire fabric, value $63,000,000, were used in 1925, as well as 108,950,000 square feet of imitation leather, the whole basis of which is cotton, for tops and coverings. Other important items are: 30,285,000 yards of upholstery, and 20,810,000 yards of materials for certain kinds of tops and side curtains. Entire automobile bodies are now made of materials of which cotton is the base, while the modern automobile demands cotton in the construction of such articles as: wheel coverings, seat linings and backing, fan belts, check straps, door straps, gaskets, pedal linings, plain and coated upholstery for sides, seats and tops, closed car roofs and open car tops, curtains, window linings, brake linings, steering post covers and cloth for rear and side boxes used as trunk carriers.

What of Synthetic Rubber?

Has the Caoutchouc Riddle Been Solved at Last, or Has a Half Century Quest Been Futile?

TO the oft-asked question, "Is there really anything in synthetic rubber?" the public gets a confident, affirmative reply through non-technical channels. There are many who believe that making real rubber is now one of the industrial arts, while others who are better informed can not understand why, after fifty years of research and experimenting, synthetic rubber is not now a marketable commodity. They have heard how synthetic chemistry rendered waste the indigo fields of India and the madder farms of France, how it duplicated so many rare dyestuffs and developed hundreds of drugs, flavors, and perfumes; how substances hitherto unknown, such as the synthetic resins, have been fairly created from unpromising materials, and they can not understand why chemists by juggling molecules are not able to make almost anything to order.

Economists find encouragement in the progress of chemical research, especially with regard to rubber. They see in the gathering of wild and the growing of plantation rubber, in preparing and shipping the product, operations involving a great deal of waste, modified of late by direct use of latex, but nevertheless connoting real inefficiency. If a considerable saving is to be realized and a uniform, standardized raw material provided, such advantages can only come, they contend, through synthetic production of rubber; and that the rubber industry will finally come to it in self-defense.

Summary of Synthetic Efforts

While rubber's components had been separated long before, it was not until 1879 that a way was found to put them together again to make a substance approximating the original. In that year Bouchardat in France succeeded in doubling the molecular weight of isoprene (the hemiterpene or oily, volatile hydrocarbon, C_5H_8, commonly distilled from caoutchouc, gutta percha, or turpentine) with a strong aqueous solution of hydrochloric acid. Tilden in England, Harries in Germany, and others later also found ways of polymerizing isoprene and its homologs into a substance having the accepted rubber formula of $C_{10}H_{16}$. Others soon produced similar results with cyclohexanol and para-methylcyclohexanol (products of phenol and para-cresol). Kirchof later raised a doubt as to whether the substances were identical, conceding to synthetic the formula $C_{10}H_{16}$, but regarding natural Para rubber as $C_{10}H_{17}$. Doubtless many a chemist has since tried hard to add another hydrogen atom to his synthetic molecule to make it equal Kirchof's formula.

The discovery that isoprene could be derived from materials other than those mentioned gave fresh impetus to the search for a real synthetic rubber, as it also raised the hopes of manufacturers and the fears of planters when rubber was dear. It was found that isoprene, still regarded as the foundation of the best synthetic rubber, could be obtained from coal tar, fusel oil, coke, and even gases such as acetylene obtained from calcium carbide. Further encouragement came when a hydrocarbon capable of being polymerized to the rubber formula was obtained in a simple process from butadiene and dimethylbutadiene or methyl isoprene. During the World War the latter was made in Germany, where rubber shortage was acute, by reducing acetone to pinacone with aluminum and caustic soda and then dehydrating the pinacone.

Hope of Cheap Synthetic

"Cyclopentadiene caoutchouc" is one of the newer synthetic rubbers. It is said to be a methyl butadiene hydrocarbon polymerized with tin tetrachloride as a catalyst, and that it can be swelled in the usual rubber solvents and even vulcanized with sulphur chloride in chloroform. When one chemist was reminded that its cost had been put at $80 a pound he remarked cheerfully, "That is nothing. Even if it were quoted at its weight in gold, we should not forget that scarcely three years ago but 15 gallons was all the world was said to have had a tertiary butanoland the price was $16 per 100 grams. Now it can be had in tank car lots at 50 cents a gallon, all due to chemical research. Who can say that material for producing synthetic rubber may not be produced as cheaply and as suddenly?" The average researcher is not easily discouraged.

Many believe that the economic problem will be solved by getting hydrogen from steam, duplicating part of the process of making water gas, and with some catalyst uniting it with carbon from petroleum so as to reproduce the rubber hydrocarbon. There has been much speculation as to what might be done with the olefins and diolefins, and it was asserted recently that with a proper cracking process crude petroleum could be made to yield 5 per cent of the butadiene needed for making synthetic. It has even been figured that 52,000,000 barrels, or but one-fifteenth of the yearly American output of crude oil, could be made to supply 4,000,000,000 pounds, or over 1,818,000 long tons, of rubber, equal to nearly three times the 1926 world production from all sources.

Why Some Are Not Sanguine

In looking for a complete solution of the fascinating problem, perhaps the public expects too much of chemists. Even some of the latter in their enthusiasm do not seem to realize that the production of a substance having the unique structure and the peculiar technical qualities of rubber is a very different task from elaborating, for instance, complicated derivatives of coal tar. While the best synthetic rubber may chemically duplicate natural rubber, analyzing as isomeric with caoutchouc, there is nevertheless a difference. For instance, synthetic does not lend itself to vulcanization as does natural rubber. It was early found that the best of the made products that obtained from methyl-isoprene would not react with sulphur as would real rubber. Piperidine and some of its derivatives were tried as vulcanizing agents, but results were disappointing. Even where a little success was obtained, the manufactured article failed to show qualities that could at all rival those of ordinary cured rubber.

One of the unique features of true rubber is that all of its remarkable characteristics are carried through every process, and in some of them even intensified, a phenomenon not yet duplicated by any of the synthetics. While some of the latter have made a fair showing in the making of hard rubber goods, they are unavailable for soft rubber articles. They do not age well, even when compounded with the amines and other substances used in modern anti-oxidants. If such a substance be originated, it is more likely to come from the research department of a modern rubber works well equipped for applying every conceivable test to such a product.

Beyond Test Tube and Microscope

Few stories in the romance of chemistry are as interesting as that concerning the hunt for the obscure something which differentiates real from approximate rubber. Finally a hint as to the nature of the missing link which has so long eluded chemists and microscopists has been afforded in the X-ray studies of rubber by Katz and Hock. In what hitherto had been regarded solely as a colloid, spectrograms reveal a most minute yet distinct crystalline structure and parallel arrangement of particles. These infinitely small crystals vanish, however, or are hidden when the caoutchouc returns to normal state.

No such structure with nascent or perhaps preformed glistening crystals has been observed in X-ray study of synthetic rubber. Hence is the absence of such "crypto-crystallites," having a nature perhaps akin to crystalloids or protein crystals, regarded as conclusive evidence that synthetic is not identical with true caoutchouc. A further proof of substantial dissimilarity is afforded when the two substances are frozen in liquid air and then broken. The cleavage of each is quite different from the other.

If elasticity be "the maintaining of an equilibrium between a higher and at least one lower polymerized hydrocarbon of the same chemical constitution," as defined by Hauser, such a theory would appear to apply aptly to the behavior of the caoutchouc basis cell, the formula of which was lately figured as $(C_5H_8)_8$ and more recently as $(C_5H_8)_6$. In the complex nature of such a molecular aggregate, as contrasted with the simpler unit of isoprene, even when polymerized to $C_{10}H_{16}$, evidently lies the secret of caoutchouc's greater elasticity as compared with synthetic rubber.

Rubber Growers Not Uneasy

Rubber growers appear to be but little troubled with the predictions made by some for synthetic. They see no menace looming, and the foundations of the planting industry are stronger now than ever. They are sure their problems, now more economic than agricultural, will right themselves long before any synthetic could be considered at all competitive. The natural supply is likely to remain plentiful, and millions of acres available for planting will be speedily used when demand increases and lower production cost is effected. Even now output cost, it is claimed, can be kept well below 20 cents a pound, a point which synthetic is not likely to reach; and high-yielding strains of trees may increase acreage output from 300 and 400 pounds of rubber to even 1,000 pounds.

Rubber, it is contended, can never be produced as cheaply in a factory as in nature's laboratory; and as the world for a long time to come must get the bulk of its supply through the systematic cultivation of rubber-yielding plants, holders of planting shares feel that the most improbable thing that could happen would be for synthetic to give them a jolt such as phonograph stockholders got in the recent past when radio came like a bolt from the blue.

CRUDE RUBBER CONSERVATION

A nice tribute to American ingenuity in dealing with a peculiar proposition in retrenchment is paid by the United States Department of Commerce in its recent compilation of rubber conservation statistics, and in which it is shown that but 366,000 tons of crude rubber had been used in 1926 as compared with 388,000 in 1925. Credit for such economical use of an essential raw material, and which helped much in keeping the price within reasonable bounds is due, however, mainly to American rubber manufacturers. It was they who last year, through improved compounding and more efficient processes, aided largely by makers of rubber machinery and supplies, and notably by rubber reclaimers, made it possible to amply meet the vast demand for high quality products without consuming as much raw material as had been used in the preceding twelve months. The manufacturers' response to Secretary Hoover's appeal for more frugal use of rubber was decidedly active and well sustained, while that of the puplic was unmistakably passive, despite the Secretary's urge of cooperation.

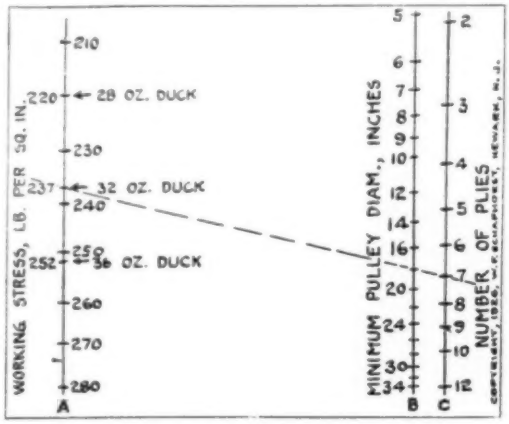
AMONG THE TEN LEADING CLASSES OF GOODS EXPORTED DURING 1926 from the Bremen consular district of Germany were rubber and gums, having a combined value of $312,072, this figure representing an increase over 1925 of $228,000, or 272 per cent. The commodities listed, according to *Commerce Reports*, included small manufactured rubber articles, such as hot water bottles, combs, etc.

What Pulley for Rubber Belts?

W. F. Schaphorst, M. E.

This chart tells almost instantly the proper diameter of pulley to use for any number of plies of rubber belting. It also takes into consideration any working stress ranging from 210 to 280 pounds per square inch. It furthermore makes the problem simple by giving the three most common weights of duck in Column *A*: 28-ounce, 32-ounce, and 36-ounce, corresponding with 220, 237, and 252 pounds per square inch working stress respectively.

For example, if a given belt is made of 32-ounce duck and it is a 7-ply belt, what is the minimum pulley diameter? Answer: Run a straight line through the point in Column *A* corresponding with 32-ounce duck and the 7, Column *C*, and the intersection with Column *B* gives the answer as 18 inches, minimum pulley diameter.



Rubber Belt Chart

In other words, run a straight line through the working stress, Column *A*, and the number of plies in Column *C* and the intersection in Column *B* gives the minimum pulley diameter. Because of the fact that rubber belting is always made up in plies, this matter of minimum pulley diameter is important. Extremely small pulleys must be avoided if at all possible. Thus column *B* shows that no pulley smaller than 5 inches should ever be used with a standard rubber belt.

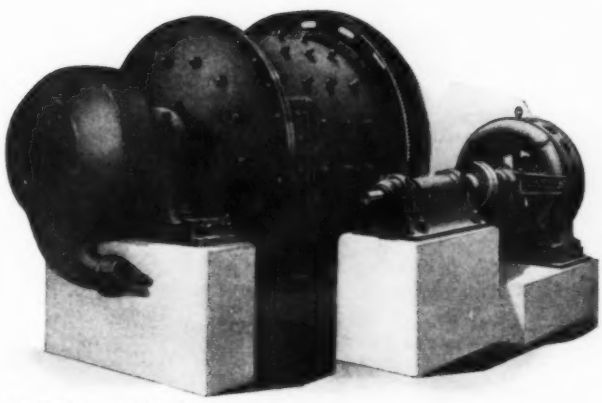
This chart is based upon the following rule: Extract the cube root of the working stress in pounds per square inch, multiply by the number of plies and divide by 2.4. The result is the minimum diameter of the pulley in inches. Or, vice versa, this chart may be used for determining the maximum number of plies when the working stress and the pulley diameter are known by simply running a straight line through the two known factors.

Belt Width Inches	Number of plies Minimum	Number of plies Maximum
2	2	3
3	3	4
4	3	5
5	4	5
6	4	5
8	4	6
10	4	6
12	4	6
14	5	6
16	5	6
18	5	6
20	6	7
22	6	7
24	6	7
26	7	8
30	7	8
36	8	10
42	8	10
48	8	10
54	10	12

To assist in the selection of a well balanced belt so that it will be neither too thick nor too thin, the above table will prove useful. Thus, for instance, if the belt width is 10 inches, it is generally considered best not to use less than 4 or more than 6 plies.

Rubber in the Mining Industry[1]

Its High Efficiency Shown in Ore Excavating, Dredging, Conveying, Milling and Treating—Rubber Factory a Mine Adjunct



Allis Chalmers Mfg. Co.

Typical Rubber Lined Ball Granulator

WHILE improvements in mining engineering may not have been as spectacular as the recent changes in other lines, they have nevertheless made a deep impression on the industry directly involved as they also promise to affect favorably both rubber production and manufacturing. Engineers have been learning that rubber can supplant with striking advantage materials hitherto considered indispensable, and enterprising rubber manufacturers have been showing them how unjustified has been their lack of confidence in rubber. Familiarizing themselves with the problems of the mining industry, they have shared their highly specialized knowledge with its engineers, many of whom, expert enough in calculating metallic strains, stresses, etc., were but little acquainted with the physical properties of rubber, much less about rubber compounds most serviceable for their needs.

Perhaps the greatest value of rubber in mining and milling devices will always be as an abrasive resisting material. Wear and tear on all kinds of machinery must be minimized. From the moment the rock is blasted in a stope and falls through a winze, is carried to an ore chamber, dumped into a skip, lifted to the surface, cast into a bin, conveyed to crushers, ground, carried to a mill, comminuted, transferred to screens, jigs, tables, classifiers, and treatment plants there is almost continual abrasion of equipment by the sharp edged broken mineral. If the ore or pulp be wet with acid or alkaline solutions there may be also much damage through corrosion.

Frequent replacement of bearings injured by exposure to gritty or corrosive substances has been one trouble which has been markedly lessened through the use of rubber. The difficulty has been quite overcome by using rubber bearings with spiral grooves to allow water lubrication. Instead of the grit grinding between two metal surfaces, it rolls over the rubber facing, which yields to the pressure, until it reaches the groove through which it is washed out by running water. Such bearings are especially advised for centrifugal pumps and submerged machinery.

Power and Conveyer Belting

The advantage of rubber belting for power transmission has long been appreciated by mine operators. They have found that it costs less than leather, that it transfers engine energy with less loss, and that it deteriorates much less where there is much moisture or acid fumes. It is, however, as ore conveyers that rubber belts have shown especially their superiority over those of leather. They carry the hard, loose material better and have a longer life than even hardened steel. Under a 5-ton running tension on its rubber conveyer belting one company carries an average of 8,500 tons of coal daily for four miles, using over 45,000 feet of 8-ply 32-ounce duck, rubberized, and having a 3/16 inch rubber carrying surface. Even though the latter surface is rarely exceeded, and the under surface is seldom over 1/16 inch, the endurance of such belting is remarkable.

In dredging alluvial sand and gravel and in all placer mining there is a tendency to conduct operations on a greater scale. This means using larger vessels, but it also means keeping construction as light as possible to better stabilize the dredging outfit. Hard manganese steel may be essential for the edge of the excavator scoop but rubber is replacing it in many other parts of dredges, reducing weight, lessening cost, and increasing efficiency.

Among the dredger uses in which rubber has proved better than plain metal has been in lining side runs or short launders for the sand, lining tail chutes, lining sand pipes, lining the walls of drop chutes, and for the bottoms of stone chutes. In one case a hard steel bottom was replaced with rubber, and the latter not only cost but one-ninth the price of the steel bottom but lasted over one and one-half times as long. A tail chute 7/8 inch matting showed after a year's service scarcely 1/8 inch of wear, while the steel bars holding the rubber matting had to be replaced twice. The life of the matting is estimated as three times that of steel. It was made of pure rubber sheets blanketed and joined together somewhat like crepe soling, and a familiar type of which in Far East dredging operations is the material made by the Wilkinson process.

Wilkinson Rubber Process

Mats and sheets for lining mining machinery and for other uses are made according to the Wilkinson process by adding wetted sulphur and oxide of lead to rubber latex, allowing the rubber in the fluid to coagulate with or without the usual agents, and then creping the coagulated material and building it into suitable blankets. Even powdered pigments or dyestuffs may be added to the latex. The product contains about 95 per cent of pure rubber. The sulphur and lead oxide effect vulcanization slowly and at ordinary temperatures.

Thus the Wilkinson process differs from the Schidrowitz or "Devon" process. In the latter the cold vulcanization of latex is effected through the action of alkaline polysulphides and the coagulate finds use when both cured and dried. Opportunity has not yet been afforded for a thorough comparative test of the industrial value of the two materials.

Rubber Lined Chutes and Piping

Rubber covered flotation impellers have replaced all-metal impellers in a large American copper concentrating plant, they having been found to be more resistant to abrasion and corrosion. In other mining plants rubber has been found to be an ideal liner for launders carrying pulp and tailings, as well as for pipes carrying sand for underground fillings. For protecting ore chutes from abrasion rubber ranks high over metal or wood. In a car-loading chute delivering over 1,000 tons of gravel daily a steel liner wore out in seven days, but a rubber liner, even though it cost twice as much, showed no noticeable wear after six months' continuous use.

Unlined steel pipe in a deep mine has been known to corrode so much as to be unfit for use in five months, while a rubber lined pipe put in its place has shown apparently no wear after two years' service. The advantage of such lined pipe in placer mining where there is much sand attrition has been also notable. In a case where

[1] Data abstracted from "Rubber and Its Uses in Mining" by Park and Eaton.

pipe was required for hard service with gravel pumps the pipe was rubber lined in the following way: For each of the 20-foot sections of 9-inch pipe, cast in longitudinal halves, a tube of crepe rubber was made with all the sheets in the blanket so overlapping as to cover joints beneath and forming a 3/16-inch wall. This rubber tube was laid in one-half of the pipe and then covered with the other half of the pipe, flanges along the edges of the pipe affording means for bolting the sections together.

Rubber Reduces Tube Mill Costs

Particularly striking has been the economy obtained through the use of rubber as a liner for tube grinding mills and in which abrasion and replacement had been heavy cost items. As lining material rubber has been substituted for silex bricks, chilled iron, and chrome and manganese steel with decided benefit. A Canadian government report shows that where a 5-inch "Linerite" vulcanized rubber sheet was placed in a 4-foot diameter 20-foot tube mill using 1½-inch iron balls and finely grinding quartz-like ore for three months, the loss in weight of the rubber was so negligible that it was decided to at once equip a larger mill with the same kind of lining. Six months later the liner was still in excellent condition. On an improved rubber liner the wear was found to be even less than 1.5 per cent in three months of hard use.

Advantages gained with the rubber liner, besides saving of time and cost through frequent replacements, are lighter mechanism, less weight on bearings, reduction in power loss, and lower cost of freighting. In one plant rubber lined tube mills effected a savings of 20 per cent per ton on pulverizing ore. The advantage of increased tube capacity and less capital expenditure may be had with rubber liners. Roughly estimated, one pound of rubber may be substituted for ten of steel, and though both may cost about the same, an ultimate saving of 50 per cent may be credited to rubber as it wears twice as long as steel.

Answering an objection that rock particles between steel balls and rubber linings are not ground, and that to that extent the mills lose in efficiency, it is stated that the actual crushing is done between balls and pebbles; and the balls function best in rebounding from a resilient liner. Where rough chunks of rock are used as an abrasive in mills the rubber lining may be fortified with fine wire mesh or netting.

For Concentration and Other Uses

Fine concentration of crushed ores is effected with vanning belts, a familiar type being of 2-ply rubberized fabric, 4 to 6 feet wide, with its 3/16-inch rubber surface containing graduated corrugations into which pulp settles while the belt is being laterally vibrated and run up a low slope. Rubber can be adapted to every possible requirement in separating and holding concentrates. For lining jig frames, rubber having high abrasion resistance and a low friction coefficient under water lubrication makes an ideal material. It is held that it could also be used with positive gain for lining feeders, distributers, dewaterers, cyanide tanks, precipitation boxes, and much other mining equipment.

The fact that much large piping is now being lined on the ground suggests to some the possibility even of rubber foundries being early adjuncts of modernized mines.

AMMONIATED LATEX RUBBER CONTENT

The results of the investigation of the rubber content of ammoniated latex as reported by R. O. Bishop are as follows: The method of accurately evaluating latex on its rubber content as determined by acetic acid coagulation is not a simple process. If the principal object is to obtain a coagulum of maximum weight, regard must be paid to factors concerning quantity of preservative, period of preservation and concentration of coagulant. Where concordant results are to be obtained it is necessary to elaborate the method and to provide for the differences which normally occur between latices from different estates under different conditions.

[1] *Malayan Agri. J.* Jan., 1927, pp. 21-23.

Brake Drum Heat

Early in 1926 the Goodyear Tire & Rubber Co. and the Budd Wheel Co. carried out extensive road tests in Florida to determine the extent to which brake drum heat was responsible for premature failure of motorcoach tires and tubes. In such tests a practically constant brake drum temperature rise of 475 degrees F. was maintained above atmospheric temperature. Believing, however, that tire tests affording a closer approximation to actual road service could be made by using a dynamometer, which would indicate the effect of brake drum heat on tire temperatures under known conditions of brake energy input, C. W. Bedford and Ernest Blaker later accumulated for The B. F. Goodrich Co. much quantitative data. The latter was imparted to the trade at the Boston meeting of the Transportation and Service Division of the Society of Automotive Engineers.

The tire tester was a 25-hp. Sprague machine and the four wheels used were: A 20 and a 24-inch Budd disk, a 20-inch motor, and a 20-inch Parker. One cast steel brake drum used had the usual outer corrugated surface extending from the flange part and across the outside of the drum, and the other had the corrugations removed and replaced with a wire fastened strip of Goodrich super-heat packing 1/32-inch thick.

Thermocouples of copper-advance wire and a potentiometer indicator were used to determine temperatures of the brake drums and the interfaces between beads and rims; and two pairs of thermocouples were set on the surface of the drums. Under the outer bead of the inside tire and directly over the brake drum were set three thermocouples; and usually two were set under the inner bead of the second tire.

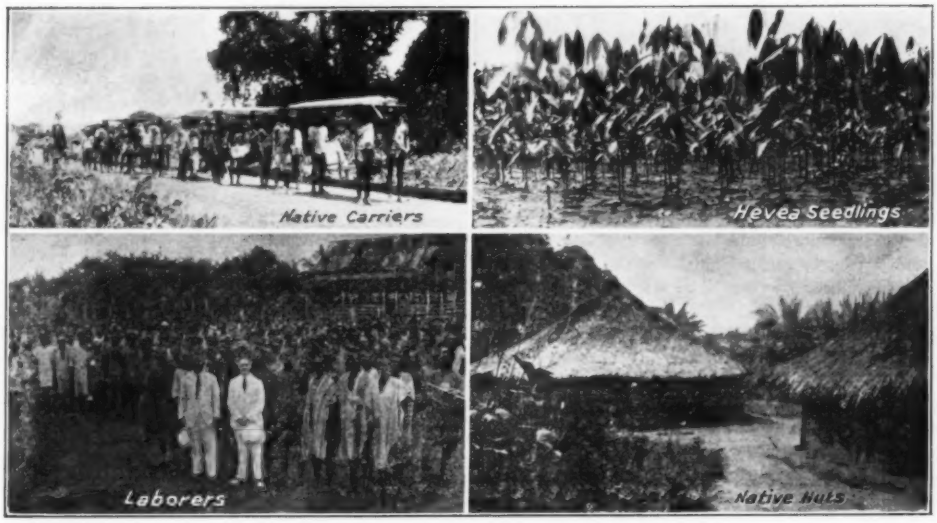
Six inch dual casings were used and run under standard loading and inflation conditions. In constant brake drum temperature tests the heat constant was maintained until an equilibrium temperature was reached at the bead directly over the brake drum. A constant brake horsepower was then maintained until a corresponding equilibrium temperature of both drum and bead was also reached.

The investigators confirm the Goodyear and Budd road service tests as to the relative cooling action of the four wheels, and in the same order; but a comparison in such order on the basis of constant drum temperature showed wide divergences. It was also found that the cooling action of a given wheel in a constant brake drum temperature test afforded no sure criterion of similar effect on other wheels; that in testing heat dissipating devices much more exact data were obtained in trying them on the constant brake horsepower basis; and that the cooling properties of a wheel increase with the speed of rotation for a given brake energy input.

It was also noted that the relative cooling action of the three 20-inch wheels was not appreciably changed by variations in speed; that the need of forced ventilation with external fans is indicated as an aid in dispersing brake drum heat, and that the slower the speed of a motorcoach the greater is the need of forcing such cooling; that "burned bead" tire trouble is not due merely to heat from tire flexing but to brake drum heat caused by dragging or excessively used brakes; and that under inflation, heavy loading, and high speed will, by decreasing the temperature gradient between bead and tread, accentuate the effect of brake drum heat on the bead.

RUBBER EXPORTS FROM MANAOS

Shipments of Para rubber from Manaos, Brazil, to the United States totaled for 1926, according to the Department of Commerce, 14,175,611 pounds, value $5,261,069, as compared with the 1925 figures of 14,879,992 pounds, value $7,954,834. The 1926 figures for caucho exports also showed a decline, 5,591,391 pounds, value $1,708,380, as against the 1925 totals of 7,124,907 pounds, value $2,639,289. A considerable advance, however, is indicated in the totals for balata, the 1926 figures being 538,084 pounds, value $212,774, as compared with those for 1925 of 305,003 pounds, value $155,903.



Typical Scenes on the Firestone-Liberia Plantations

Firestone in Liberia

Harvey S. Firestone, Jr.

Vice President Firestone Plantations Co.

IN considering the undertaking of an agricultural project outside of the United States and in tropical countries, there are four fundamentals which must be seriously and carefully regarded. They are: (1) Stability and sympathy of the government. (2) Health conditions. (3) Soil and climate. (4) Labor.

Liberia, only a few miles further from New York than is England, is a negro republic founded in 1846 by freed American slaves and other negroes and has a constitution almost identical to that of the United States. Continuously since its founding, there has been the closest alliance between Liberia and the United States. Liberia has always looked upon the United States as "Big Brother" and we have always been glad to accept that role. At times in the past, the entity of this Republic has been threatened by two powerful countries and in every instance the United States has vigorously protected its interests. Unlike so many South American countries, Liberia has an outstanding record for the preservation of law and order. Since its beginning, nearly 100 years ago, there has been no overthrow of the government and officials have always been elected by its enfranchised citizens in accordance with its constitution. The fiscal services of Liberia are administered by an American financial advisor and his staff, which plan receives the unqualified sympathy and support of the government and people.

The Government of Liberia is most sympathetic and receptive to American investment in the Republic. We have a 99-year lease on one million acres on favorable terms. We believe that our two years' experience of cooperation and help on the part of the Liberian Government and its people is indicative of what we may expect in the years to come.

From our investigation and observations, health conditions are fundamentally better than exist in nearly any tropical country. This does not mean, of course, that Liberia is devoid of the usual tropical diseases, but there is little question that the problem of eradicating these is very much simpler than has been the case in most tropical countries. Malaria is the chief offender, although not in the violent form that existed in such other countries as Panama. If proper care is used, the chances of contracting malaria from a malaria infected mosquito are very remote. The Harvard School of Tropical Medicine has just finished an extensive survey of Liberia, and although its report on the health conditions has not yet been made, I confidently believe that this report will confirm our opinion.

There can be no better testimony regarding the fitness of the soil and climate of Liberia than is presented by the Mount Barclay plantation which we have been operating for the past two years. This plantation comprises nearly 1,500 acres of Hevea rubber trees which were planted in 1910 by an English company, afterwards abandoned and restored by us two years ago. These trees show splendid growth, are free from disease and have been constantly yielding more than 500 pounds per acre per year, which is over 40 per cent better than the general average yield of all of the rubber plantations in the Far East.

"No labor" has been the favorite cry of some of those who, for definite reasons, are not anxious to have us go into Liberia to produce rubber in competition with them. Liberia has an estimated population of two million. We now have approximately 12,000 in our employ and have hardly touched the surface of the available supply. I personally went out to see 500 men who had voluntarily walked ten days from the interior of Liberia to try to secure employment with us. One has only to be on the ground to appreciate how ridiculous is the statement of those who say that there is no labor in Liberia. The men are strong, healthy and willing to work. We give each man a thorough medical examination and vaccination and it is remarkable how few it is necessary to reject.

Due to the stability of government, fundamentally good health conditions, suitable soil and climate and adequate labor supply, we decided that Liberia is the place to grow rubber, and are undertaking this work as fast as we can, consistent with economy and best practice. Our white staff to date comprises 85 men, 76 per cent of whom are American. They occupy the following positions: general manager, auditor, accountants, paymasters, storekeepers, doctors, chief engineer, with a staff of engineers, skilled men in specialized lines such as well drilling, plumbing,

electricity, auto maintenance, etc., soil experts, mycologists, senior planters and junior planters.

Our progress in getting land felled, burned, cleared and planted, has been very good. With the results that we have now obtained, we are practically sure of having 20,000 acres of rubber actually planted by the latter part of this year. It is my understanding that this is the greatest area of rubber which has been set out by one concern in this length of time. We hope to be so organized in the near future that the total annual additions in succeeding years will be very materially increased.

As a part of the general development scheme, we are actively engaged now in the following undertakings:

The construction of houses for our staff and for the native workers.

The building of approximately one hundred miles of road.

The exploration of extensive new areas to determine the best location for additional development.

The generation of hydroelectric power from several rivers eminently suitable.

Well digging and other engineering work for the early establishment of a safe and adequate water supply.

Dirct radio communication with the United States.

The installation of stores to provide the best food and other supplies to our men at a low cost.

The establishment of a better and more adequate school system for Liberia in cooperation with the Liberian Government and the American Advisory Committee on Education in Liberia.

Puncture Sealing Compounds

The Bureau of Standards of the United States Department of Commerce has been studying methods and materials for sealing punctures in tubes of pneumatic tires, and it gives its findings in a circular on "Puncture Sealing Compounds for Pneumatic Tires." No recommendations are given, and many may thus infer that the Bureau regards such makeshifts as scarcely worth while, except in a few emergencies.

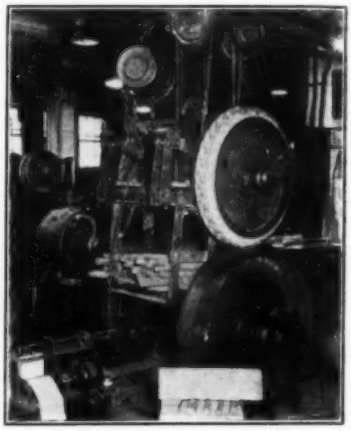
The simplest compounds, it is stated, contain only fiber and water; but nearly all have as fiber either asbestos, mica, cork, wood fiber, paper pulp, bran, various barks, ground linseed, moss, leaves, grass, seeds, and oatmeal. To hold fiber in suspension use is made of flour starch, dextrin, gelatin, glue, sugar, glucose, caramel, gum arabic, soap, and water glass. To lower the freezing point alcohol, glycerin, salt, or calcium chloride have been used; and for preservatives formaldehyde, carbolic acid, boric acid, chloroform, or some asphaltic substances. Other components found have been whiting, clay, graphite, and cactus juice, which may aid the fiber in sealing.

Compounds are designed to not only coat the inner side of a tube but to flow to the point where a puncture occurs. The effect is to crowd into an opening, with the aid of air pressure, a plug of fiber not in any way cemented to the rubber. At best the plug hardens but slowly, and its life is not very long. For cuts or tears such compounds are quite unavailable. Simple compounds made with either ground asbestos fiber and water glass, or leather fiber and glycerin, and introduced with water sealed even holes made with a 30-penny nail, operated just as well as those for which much merit was claimed by the makers.

Most compounds are not harmful to tubes or casings, nor do they corrode valves. If a hole does not seal, however, the water might be forced out into the casing and perhaps damage the latter, or reaching the rim might cause the latter to rust. They do not appear to lessen resiliency nor interfere with valve action. The claims made by some makers that their compounds render tubes less porous, prevent air leakage through valves, keep tires cooler, and preserve rubber may be regarded as mostly sales talk. It is noted, too, that of all the compounds produced in the past thirty years none has come into general use, and that tires and roads have been so considerably improved that punctures that might be sealed with compounds are now comparatively few.

Cushioning Quality of Tires

The car motion causing the greatest discomfort to passengers in automobiles is in a vertical direction. It is this shock that the tires absorb most effectively. An instrument, known as a "bounce recorder," designed and used in the research laboratory of the Goodyear Tire & Rubber Co., Akron, Ohio, is here pictured in connection with the machine upon which tires are tested.



Goodyear Tire Bounce Recorder

A solid tire is shown mounted on a heavy steel wheel and resting on the drum in the right foreground.

Vertical movements of the tire or of the load are transmitted through the cables extending to the left from the drum and are recorded by copper-pointed pencils on a strip of indicator paper drawn at a constant speed by a motor. Helical springs keep the cables under tension at all times. A stationary pencil traces a base-line on the moving paper from which ordinates of the record curves can be measured without regard to slight motions of the paper from one side of the guide-rolls to the other. A fourth pencil operated by a cable extending to a cam on the main motor-shaft, makes a mark on the paper at every revolution of the motor. This furnishes a means of checking the constancy of the speed of the paper. The paper used for records is engine-indicator paper, furnished by the makers in convenient rolls.

For all practical purposes the initial vertical acceleration is a fair indication of the cushioning quality of a tire. It is concluded with regard to the relative value of static and dynamic tests as a means of determining the comparative shock absorbing capacities of tires, that whenever any two tires designed for the same service and differing slightly in road quality are tested, the static and dynamic tests always distinguish these capacities in the same order.—*J. Soc. Auto. Engrs.*, March, 1927.

AMERICAN GOLF BALL IMPORTS

United States imports of golf balls have, according to the Department of Commerce, steadily increased during the last few years in both volume and value, the totals being: 1924, 2,834,340 balls, value $1,057,711; 1925, 2,806,383, value $1,165,864; and 1926, 3,361,248, value $1,377,205. The United Kingdom has been the main and almost exclusive source of supply, only small quantities having been shipped from France and other manufacturing countries. During the first two months of the present year the number of golf balls imported into the United States has already reached a total of 231,500 as compared with 116,164 for the corresponding months of 1926. The February unit value was 39.1 cents per ball, as against 25.1 cents in January and 23.1 cents in December.

ARC WELDING COMPETITION

The Lincoln Electric Co., Cleveland, Ohio, is offering $17,500 in prizes to competitors throughout the world who present satisfactory essays on the subject of recent advances in the art of arc welding. The American Society of Mechanical Engineers has accepted the custody of these prizes, the award for the best paper being $10,000, and for the other two $5,000 and $2,500, respectively. Detailed information can be obtained from The American Society of Mechanical Engineers, 29 West 39th street, New York, N. Y.

American Chemical Society

Rubber Division Meeting

THE Seventy-Third Meeting of the American Chemical Society was held April 11 to 16, at Richmond, Virginia, where two sessions of the Rubber Division occurred. The attendance at each numbered fully 200 chemists.

The first session opened with a paper on electroplating rubber by A. Szegvari. This proved of absorbing interest and was illustrated by electroplated samples of pure and compounded rubber, also by experimental demonstration during the reading of the paper. Two other papers of great practical interest were those on the conversion of rubber into thermoplastic products. These reported researches by Harry L. Fisher and his coworkers of The B. F. Goodrich Co. The practical applications of the products developed have much scientific and practical interest. They serve for the permanent attachment of rubber to metals and also as the base of a paint known as "Thermoprene," for the protection of metals against oxidation and the destructive action of corrosive materials. The paper on this protective paint and one on the colloidal dispersion of pigments were read before the Section of Paint and Varnish Chemistry and repeated before the Rubber Division because of their rubber interest.

The second session opened with reading the progress report of the Physical Testing Committee. The researches of this committee, now in progress at the Bureau of Standards, are being privately financed. A question was raised concerning the continuation of the work and further financing, the members present voting that the work be continued under the auspices of the Rubber Division and the method of its financing be determined by the Executive Committee of the Division.

The informal dinner and smoker held at the Winter Garden of the Hotel Richmond the evening of April 14 was attended by nearly 150 chemists. A matter of special interest was the suggestion of Chairman Dinsmore that changes are desirable to afford greater scope for members to participate in the discussion of papers read at the meetings. Under the present arrangement of semi-annual meetings so many papers are read in the time allotted for the sectional meetings that discussions are virtually eliminated. The value of discussion of papers is well recognized and the suggestion to increase the opportunity for it was made to ascertain the views of the division. Doubtless various plans will be proposed for later consideration.

The assemblage approved the suggestion that the Rubber Division accept the invitation of the Organic and Cellulose Divisions to hold a joint symposium on polymerization during the fall meeting at Detroit, Michigan.

No set speeches were delivered at the smoker. Chairman Dinsmore read an appreciative letter from Dr. van Rossem, whose friendly sentiments were heartily applauded by the chemists present.

Charles R. Boggs and Dr. A. A. Somerville, who have recently lectured before the Institution of Rubber Industry in London, contrasted the American method of presenting and discussing scientific papers with their recent experiences in the same line in London and Paris.

H. E. Howe, editor of *Industrial & Engineering Chemistry*, enlightened those present on the requirements necessitated by the magazine's publishing service in presenting authentic versions of papers and individual discussions upon them.

The smoker concluded with a very amusing original skit displaying the difficulties of standardizing specifications for rubber goods manufacture.

Abstracts of Papers

Isolation of Natural Oxidation Inhibitors of Crude Hevea Rubber. A study has been made of the natural anti-oxidants present in crude Hevea rubber which are removed by acetone extraction. Two of these substances have been isolated from the unsaponifiable matter of the acetone extract as high-boiling liquids which occur to the extent of 0.08 per cent and 0.16 per cent in crude Hevea rubber. These are powerful anti-oxidants. They possess the formulas $C_{27}H_{42}O_4$ and $C_{20}H_{30}O$ respectively, and appear to be unsaturated liquid sterols. In addition, three other compounds have been isolated from the resin, namely, normal octadecyl alcohol, hydrocarbon $C_{15}H_{24}$, and a highly fragrant ketone $C_{15}H_{24}O$. The paper describes the methods of separation, identification, and testing of these compounds.—H. A. Bruson, L. B. Sebrell, and W. W. Vogt.

Electroplating of Rubber: Colloidal Galvanoplasty. One important early utilization of the movement of colloid particles in the electrical field for galvanoplasty, "Colloidal galvanoplasty," is the electro-deposition of rubber articles from dispersions. Reasons are presented why rubber dispersions are especially suitable for this purpose. The physico-chemical conditions during electro-deposition of rubber emulsions deserve special attention. Inside of the baths between the electrodes, the electro-chemical, electro-kinetical, and sedimentation phenomena are to be considered. On the electrodes themselves electrical discharge and coagulation of particles are of most importance. The mechanism of building up a layer by electro-deposition is described. Main items for comparison between electro-plating from a colloid solution and a molecularly dispersed one; the speed of migration; material moved by unit of current; electrical discharge of ions and colloids at the electrodes; influence of electro-kinetic and capillary forces in both cases; mechanism of layer formation; crystallization in one and coagulation in the other case. The advantages for industrial applications are various: (1) Low current cost. (2) More automatic, labor-saving production possibilities than hitherto. (3) Great adaptability for various purposes and articles. In addition to the above, certain facts make this process especially adaptable for use in the rubber industry: (1) A suitable raw material already at hand. (2) Rubber articles produced by electro-deposition are of inherently higher quality. (3) The elasticity of rubber products makes them especially suitable for depositing on more or less complicated molds and permits easy stripping of the product therefrom.—A. Szegvari.

Seven Years' Experience with a Mill Room Testing Laboratory. A great many factory difficulties are caused by improper mixing and errors in compounding. These difficulties may be overcome by establishing a testing laboratory in the mill room where each batch is tested. This paper gives a description of the methods of test necessary together with the results obtained. A new instrument for testing is described.—R. M. Warner.

The Effect of Temperature on the Tensile of Reclaimed Rubber. The percentage change in the tensile strength of vulcanized reclaimed rubber with variations in the temperature at which the tests are conducted is appreciably greater than in the case of vulcanized new rubber mixtures. It has been shown that the tensile decreases with increasing temperature for various types of reclaimed rubber. The average varia-

tions in tensile tests conducted at 20 degrees and 30 degrees C. amounts to approximately 17-23 per cent (based on a tensile of 50 kgs. per sq. cm, at 20 degrees C.). It is possible to compensate for normal variations in temperature by means of a correction chart.—Henry F. Palmer.

The Conversion of Rubber into Thermoplastic Products with Properties Similar to Gutta Percha, Balata and Shellac. Part I. Methods of Preparation and General Properties. By heating in sheet form a mixture of rubber with approximately 10 per cent of its weight of either an organic sulphonyl chloride or an organic sulphonic acid, for several hours at 125-135 degrees C., it is converted into tough, thermoplastic products resembling gutta percha and hard balata. If heated similarly in bulk there is a pronounced exothermic reaction and the products are hard and thermoplastic like shellac. Para-toluene sulphonyl chloride and para-toluene sulphonic acid are suitable reagents. A 7.5 per cent mixture of p-phenol sulphonic acid under similar conditions gives a flexible product similar to gutta percha. It is soluble in benzene, is a very good adhesive, and is the basis of the Vulcalock process. Five per cent by weight of concentrated sulphuric acid milled into rubber and heated as above gives balata types but not the soluble shellac types.—Harry L. Fisher.

The Conversion of Rubber into Thermoplastic Products with Properties Similar to Gutta Percha, Balata and Shellac. Part II. The Chemistry of the Reaction and the Products. The shellac-like products have been studied chiefly. After purification it is found that the chief constituent is a hydrocarbon with the same empirical formula as that of rubber, C_5H_8, and that it is 55-65 per cent as unsaturated as the rubber hydrocarbon. Addition products of HCl and HBr have been prepared. Vulcanization with sulphur gives a maximum combined sulphur content of about 21 per cent corresponding to 57 per cent unsaturation as compared with rubber. Oxidation, hydrogenation, bromination, nitration, etc., have also been studied. The purified hydrocarbon is white and is completely soluble in the rubber solvents and insoluble in alcohol, acetone, etc. It is much more stable toward heat than rubber. The gutta percha and balata-types are only partially soluble, but analyses, yields, etc., indicate that they consist of similar isomeric hydrocarbons.—Harry L. Fisher and Eugene M. McColm.

The Chemical Unsaturation of Rubbers Vulcanized with Polynitro Compounds and Benzoyl Peroxide, and its Possible Bearing on the Nature of Vulcanization. The results by the Kemp-Wijs method indicate that there is no change in the unsaturation of the hydrocarbon during these vulcanizations. The error in the method may amount to as much as 0.5 per cent, which is equivalent to about 0.13 per cent of oxygen, and therefore does not show completely whether or not a lesser amount of oxygen has been added. It is believed that this work substantiates the theory that sulphur vulcanization is an unknown or undetermined type of change in the hydrocarbon, and that the chemical union with sulphur is a chance secondary reaction. The union of sulphur produces a further change which no doubt gives properties which are very important in the manufacture of rubber goods.—Harry L. Fisher and A. E. Gray.

The Determination of the Rubber Hydrocarbon in Vulcanized Rubber by the Kemp-Wijs Method. The dried, acetone-extracted sample, in thin strips, is carefully dissolved in boiling tetrachlorethane or pentachlorethane, and the rubber hydrocarbon determined by means of the Kemp-Wijs method using iodine-chlorine. The combined sulphur is also determined and the corresponding amount of rubber hydrocarbon calculated and added to the above to obtain the total amount. An alternative method is to allow the thin strips to swell in carbon bisulphide and then let the reagent react for 24 hours. The errors are 0.5 to 2.0 per cent, depending on the type of vulcanizate. The chemical unsaturation of several different kinds of raw rubbers and of their acetone extracts has been determined and the data included.—Harry L. Fisher and A. E. Gray.

Some Accelerator Characteristics as Revealed by Coefficients of Vulcanization. The rate of sulphur combination in an unaccelerated rubber-sulphur compound during vulcanization has been shown by various investigators to be a straight line function of the time. With accelerated mixes this is usually not the case, and some striking differences in this respect are pointed out in this paper.—A. F. Hardman and Frank L. White.

The Measurement of the Abrasion Resistance of Rubber and Some Relations Between Abrasion and Treadwear. Abrasion is the process of wearing away the surface layers by doing work on the surface. The amount of work done depends upon the resistance which the rubber exerts when it is moved against the abrasive. Under the same conditions the resistance offered by two samples of rubber may vary 100 per cent. The usual type of abrasion machine disregards this factor. A machine has been devised which measures the power consumed in abrasion and the results are expressed as volume loss per unit of work done. The relation between abrasion resistance and tire-treadwear is rather complicated and a study of a number of factors including rolling resistance of the tread and tread design would assist in determining the value of a tread-stock.—Ira Williams.

Protective Paint from Rubber. A protective paint known as "Thermoprene," made from rubber, has been developed, using rubber solvent as vehicle. The chief features of this paint are: (1) Resistance to acids, alkalies, corrosive gases, and corrosive chemicals in general. (2) Low permeability to moisture, salt solutions, salt sprays, etc. (3) The film is tough and can be bent without injury at sub-zero temperatures. (4) It does not flake when cut and rust spreads very slowly from an exposed area.

Remarkable adhesion to metals is also an important feature. The paint can be made for brushing, spraying, or dipping, and in a wide range of colors. Because of its low water permeability and its high degree of adhesion, this paint promises to be very useful in chemical plants, for painting the interior of vulcanizers, etc.—Harold Gray.

The Colloidal Dispersion of Pigments in Vehicles. Pigments of most kinds may readily be dispersed in liquids such as turpentine so that they will pass through standard filter paper and remain dispersed for years, imparting their color (somewhat altered) to the liquid, giving the general appearance of oil-soluble dyes.

The method of dispersion is slow mastication in an edge runner mill, of the dry pigment with sufficient of an adhesive and cohesive substance (colloidally dispersable in the liquid) to coat the ultimate surfaces of the particles. The more adhesive and cohesive, and the more concentrated the protective colloid is, the better dispersed the pigment will be. The action is as follows: The adhesive material seizes upon the surfaces of the pigment agglomerates, pulls them apart and envelops them. The final step is thinning out or dispersion. The colloidal dispersion may be precipitated by certain agencies. —Samuel Cabot.

SEMI-ANNUAL MEETING OF N. A. C. M.

The National Association of Cotton Manufacturers will hold its semi-annual meeting May 12-14, 1927, at the Hotel Traymore, Atlantic City, New Jersey.

Matters pertaining to the industry will be discussed at the various sessions. Walker D. Hines, president of the Cotton Textile Institute, will be the chief speaker at the banquet on the evening of May 13, when members of the American Cotton Manufacturers Association will also be present.

What the Rubber Chemists Are Doing

Selenium in Rubber Compounds[1]

C. R. Boggs and E. M. Follansbee[2]

THIS eminently practical paper deals with the researches on selenium as applied in rubber compounding in which the authors make a notable contribution to the technology of rubber. Limitations of space necessitate omission of the details of their investigation. However, the following excerpts present the advantages of using selenium for vulcanizing rubber, the authors' discussion of vulcanization and the supplementary remarks by Mr. Boggs, answering questions raised by the experts who attended the reading of the paper.

Selenium

Selenium is an element in the same group of the periodic table as oxygen, sulphur, and tellurium. It occurs in small quantities in copper ores, from which it is recovered as a by-product in the electrolytic refining process. The total yearly production in the United States is approximately 230,000 pounds, but this can be increased tremendously if there is a demand. One of the peculiar characteristics of selenium is its flameproofing property. Cotton braided, rubber insulated wire can be successfully flameproofed by applying selenium in small quantities to the outside of the braid without the disadvantages that result from the hygroscopicity of ordinary flameproofing salts. Selenium acts in this manner most efficiently when applied to the surface, but it will also flameproof a vulcanized rubber compound when used as a filler. The amount depends on the percentage of rubber. About 8 per cent selenium will flameproof the lower grade compounds.

The authors summarize as follows the results of their extended investigation of selenium in rubber mixings:

Selenium acts as a vulcanizing agent to produce soft vulcanized rubber. When selenium and sulphur are used together to produce soft vulcanized rubber, the selenium acts as an efficient accelerator as well as a vulcanizing agent. Tire tread compounds vulcanized with selenium and sulphur in the presence of organic accelerators show abnormally high rigidity and abrasion resistance. This result is obtained with a variety of filling materials and accelerators. The other physical properties are practically not affected. It is suggested that the accelerating action produced by the selenium is due to selenium sulphide and that the abnormal physical results are due to the selenium and sulphur together adding to the rubber molecule.

Problem of Vulcanization

In a general way selenium forms soft vulcanized rubber in a manner similar to sulphur, the selenium combining with the rubber molecule. When selenium and sulphur are used together both combine with the rubber molecule. There are, however, some distinct differences in the action of selenium and of sulphur, and the explanation of these necessitates an explanation of the vulcanization of rubber with sulphur alone. The vulcanization of rubber with sulphur has been studied by many but no completely satisfactory theory has been evolved. Whatever the ultimate molecule is and whether they form a straight chain, cyclic, or spiral polymer does not effect our general discussion. It is known that there is a large polymer which gives soft vulcanized rubber with a small percentage of sulphur and gives hard vulcanized rubber with sulphur enough to saturate all of the double bonds. Some of the facts which indicate the nature of the chemical reactions and which are accepted by most rubber technologists are as follows:

1. There are only two stable compounds of rubber and sulphur. (a) Soft vulcanized rubber with the minimum amount of sulphur possible to produce the optimum cure. In actual practice we never obtain pure, soft vulcanized rubber, and only approach perfect stability. (b) Hard vulcanized rubber with all the double bonds saturated. The converse of this is that there is no stable rubber product with a combined sulphur of say 5-15 per cent although such a product if stable would have many valuable uses. Up-to-date such stable, leathery rubber products have been produced only by use of compounding ingredients and have not been produced chemically by having a combined sulphur intermediate between soft and hard rubber.

2. The proper cure for soft vulcanized rubber is that which gives the maximum resistance to aging and this cure is always obtained when the optimum cure is produced with the smallest vulcanizing force, low temperature, and short time. The use of organic accelerators has proved this to the rubber technologist.

3. All overcured, soft vulcanized rubber deteriorates more rapidly than a proper cure and the deterioration is faster, the greater the amount of overcure.

4. The deterioration of an overcured soft vulcanized rubber can be materially slowed up by the use of anti-oxidants. No anti-oxidants are needed, nor do they improve the aging qualities when added to a properly cured rubber. Anti-oxidants, so called, are not real anti-oxidants for true soft vulcanized rubber but for the overcured vulcanized rubber.

The consideration of the above leads us to the general conclusion that during ordinary vulcanization of soft vulcanized rubber with sulphur, there are two reactions going on at the same time; the production of soft vulcanized rubber, and the partial production of intermediate hard rubber. In producing the soft vulcanized rubber we obtain only a small portion of the intermediate hard rubber. The amount depends on the actual time and temperature, and in fact, shows the degree of over-vulcanization. This intermediate hard rubber is the cause of the deterioration of soft vulcanized rubber and its amount determines the rate and extent of the deterioration.

The obvious method of decreasing the formation of the intermediate hard rubber is to separate the temperature or time range of the two reactions so as to obtain the least portion of the intermediate hard rubber. This is accomplished somewhat by organic accelerators.

The seeming fact that there are only two stable addition products of rubber and sulphur, and the idea that the deterioration of vulcanized rubber is entirely due to the intermediate hard rubber can be, it seems, satisfactorily explained. The raw rubber polymer has two types of unsaturated bonds. One is the end double bond or some type of partial valency. The combination of sulphur with this gives soft vulcanized rubber. The other is the ordinary double bond. The complete combination of all these double bonds with sulphur gives hard vulcanized rubber. The incomplete combination of the ordinary double bonds with sulphur gives intermediate hard rubber; it leaves partial valencies unsaturated or the "bound

[1]Read at a meeting of the London and District Section of the Institution of Rubber Industry, Nov. 23, 1926.

[2]Simplex Wire & Cable Co., Boston, Massachusetts, U. S. A.

partial valencies" become "free partial valencies." The compound is in an "active unsaturated state" instead of the "passive unsaturated state." These valencies are then in a condition to take up oxygen readily and poor aging ensues. When analyzed the mixture of soft vulcanized rubber and intermediate hard rubber will show increasing percentages of combined sulphur with increasing vulcanization as it should, but just because analysis shows increasing percentages of combined sulphur there is no proof of a continuous series of stable compounds of rubber and sulphur. The failure of the old chemical theory to explain many of the facts, as for instance the failure of first order reaction equation has led to the equally untenable physico-chemical theory. We cannot see how the physico-chemical theory, for instance, in any way explains the poor aging of over-vulcanized stocks.

The above explanation should also agree with the rather peculiar properties of rubber vulcanized with selenium. At normal times and temperatures there is only one product of rubber and selenium, and that is the soft vulcanized rubber. No hard rubber can be produced with selenium at as low temperatures and times as those which can be used for hard rubber made with sulphur. The proper cure for good aging is easily obtained. Overcured soft vulcanized selenium rubber is difficult to produce. The addition of anti-oxidants is unnecessary.

The above facts are explained in the same manner on the basis that the temperature-time ranges of soft and hard vulcanized selenium-rubber are so far apart that only one reaction is obtained at the low temperatures yielding soft vulcanized rubber, and consequently no appreciable amount of intermediate hard rubber with "free partial valencies" exists which can easily add on oxygen and cause poor aging. Selenium apparently is not active enough to attack the ordinary double bonds. It satisfies only the end double bonds at usual times and temperatures of vulcanization.

The accelerating action of the selenium is undoubtedly due to the transient formation of selenium sulphides. That they probably do exist transiently is indicated by the color changes produced in the precipitation of selenious acid with hydrogen sulphide. Selenium sulphide has not been produced at ordinary temperatures as a stable compound. However, it is apparently easily produced with or in the presence of organic accelerators.

Any accelerating influence on the rate of vulcanization results in a product of better aging qualities and higher physical characteristics, but this alone will not explain the abnormally high rigidity and abrasion resistance which is obtained with selenium-sulphur rubber. The specific effect is probably due to the selenium and sulphur together adding to the rubber molecule. At present it is known that sulphur or selenium alone with or without an accelerator does not produce this effect and yet the combination does. Naturally, the assumption is that selenium sulphide is the vulcanizing agent. The results indicate that approximately equal atomic proportions are combined in the molecule on the "best" cure when atomic proportions are added to the compounds, and that the sulphur equivalent of the two is twice the normal combined sulphur. The selenium and sulphur added to most of the compounds are not in atomic proportions because there are probably three vulcanizing agents acting at different rates at the same time; that is sulphur, selenium, and selenium sulphide.

The approximate formula of the rubber vulcanized with selenium and sulphur might therefore be represented $(C_{10}H_{16})_x Se.S$ where the formula for rubber vulcanized with sulphur alone would be $(C_{10}H_{16})_x S$ and where x is the same in each case.

Further investigations and chemical analyses may elucidate more closely the mechanism of vulcanization when sulphur and selenium are used together.

Discussion

Following the reading of the paper Mr. Boggs, replying to the discussion, said that selenium had one principal quality when used in combination with sulphur, and that was, that the vulcanized rubber had an increased resistance to abrasion. It could be used. also, to reduce sulphur, with a view to preventing blooming. Selenium was used in one type of covering for cables, to increase resistance to abrasion, and gave good results in service. Non-blooming compounds formerly had been very dangerous things. They were apt to possess poor aging properties, but with selenium a non-blooming compound could be made which would not deteriorate quickly. Incidentally, selenium did accelerate. He had used the grey monoclinic commercially pure selenium ground to 200 mesh, which could be bought in the open market. The red form of selenium was not stable at normal temperatures, and if it were kept for a month it would probably go black, depending upon the crystals, the temperatures, etc. Red selenium can be bought from the producers, but they will not guarantee that it will be red when delivered. Red selenium has the same effect as the ordinary variety. A "plateau" effect was obtained with selenium, as was evidenced by the fact that it was not easy to overcure such compounds. A "blooming" could be obtained with selenium if enough selenium were used, and a greenish-yellow bloom would be obtained.

Organic accelerators can be made with selenium, and a selenium compound of diethyl-dithio-carbamate had been prepared which was a good accelerator. It is quite possible to obtain various organic compounds, some compounds give up their selenium to the rubber, and need no direct addition of the element while others act as pure accelerators. So far as he had gathered from the best books, the use of selenium had no ill effects on the operatives from the physiological point of view. If selenium got under the finger-nails, and was allowed to stay there long enough, one would have sore fingernails. If one works with volatile selenium salts one absorbs them into the body, and a disagreeable odor results; but there are no ill effects so far as he knew. As to the effect of selenium in ebonite, he said that ebonite with selenium alone would not form at normal times and temperatures. With sulphur and selenium there was acceleration to begin with, but what would be the final product he was not ready to discuss.

Discussing why one talked of deterioration of overcured compounds, he said there was deterioration, of course, in an undercured compound, but it was not so rapid as in the overcured, and it was only the oxidation which normally occurred due to the free rubber present. Replying to Dr. Hauser, he said that half-a-dozen of the large tire concerns in the United States were testing tires on the road; and report from one company showed that good results were being obtained. Tests on the road were being made but the first sets of tires of other companies had not yet worn out, and definite results could not be stated. Conveyer belts made with the selenium type of compound had also been in service for six months or so, but to date there were no signs of wear.

Most electrical properties of rubber vulcanized with selenium were no better or worse than the electrical properties of those vulcanized with sulphur. If there was a large amount of free selenium present the results tended to be worse, and if that selenium were on the surface the current might leak along the surface. He did not consider Dr. Hauser's explanation of the action of an accelerator to be satisfactory in dealing with overcured and hard rubbers, and regarded the accelerators as "sulphur" carriers and not necessarily as catalysts of polymerization. As to Dr. Hauser's criticism of the clay compounds, he said they contained a sufficient quantity of zinc oxide to activate the accelerator. A quantity of from 5 to 10 per cent of zinc oxide acted just as well with organic accelerators as a larger amount. The deterioration of rubber

due to sulphuric acid did happen, but it was not normal deterioration. There were important side reactions but it was not possible to explain the normal oxidation of rubber by assuming solely the development of sulphuric acid.

He agreed that the perfect compound from the aging point of view was very hard to get normally without accelerators, and could be produced with selenium alone more easily than with sulphur. He did not claim that selenium as such prevented water absorption. Neither the sulphur nor the selenium were responsible for that property which was controlled mainly by the impurities in the rubber. In the same way, selenium offered no distinct advantage with regard to oil absorption, and he made no special claim for selenium in that direction.

With regard to the supplies of selenium, he said that production in America could be doubled within six months if it were desired. It was obtained as a by-product during the electrolytic purification of copper; the selenium, silver and gold falling to the bottom of the cell were collected in the sludge. The selenium was separated first by oxidation. The refiners are most concerned about the gold and silver.

A-16 Accelerator

Chemically, A-16 is an aldehyde reaction product of a molecularly rearranged and polymerized aldehyde amine in which two different aliphatic aldehydes and aniline are the basic materials. Like others of the same series it displays unusual merit as an aid to vulcanization. Its many special advantages can be summarized thus: It imparts tensile strength comparable to ultra-accelerators; gives an unusually long range of useful cure; provides good aging even in overcures, and is suitable in practically all types of compounds. Stocks containing A-16 show no reversion on overcure; neither do they stiffen materially under the same condition. A-16 produces tensile strengths in considerable excess of 4,000 pounds even in pure gum stocks. Good cures are obtained in a few minutes, at either 40 or 30 pounds of steam. Equally good cures are possible at 20 pounds of steam in a longer time. Below this point, 259 degrees F., A-16 is relatively inactive.

As marketed, A-16 is a thin brown liquid consisting of two-thirds active material and one-third high boiling inert liquid diluent added for convenience in handling. The A-16 base alone is viscous and sticky, with a tendency to adhere to mill rolls. In its marketed form the accelerator is quickly absorbed by rubber. If added near the center of the batch it is all absorbed before it can reach the mill roll guides. It may be master batched if desired. Because of the physical nature of A-16, one should not attempt more than a 10 per cent master batch. The accelerator may be safely handled in the factory as it is non-poisonous and gives no form of cyanosis or rash. It darkens white and brilliant pigments, but otherwise is suitable for use in any stock. Alone it shows considerable activity and attains full strength when two parts of zinc oxide to 100 of rubber is present. To overcome varying conditions, five parts of zinc oxide are recommended in all A-16 formulas. Any further amounts acts only as a reinforcing ingredient.

Carbon black and clay exert a retarding influence on A-16 which may be neutralized by increasing the amount of the accelerator. The presence of lime renders the stock more sensitive to heat without helping the cure. The same is true of magnesia in greater degree and of litharge to a lesser degree. Mineral accelerators are therefore not recommended in A-16 stocks. Proper allowance must also be made for the presence of such softeners as pine tar, rosin, etc., which are retarding when present in any considerable amount.

Because of the possibility of deficiency of organic acids in certain rubbers it is desirable to use stearic acid in A-16 compounds, particularly when off grade rubbers are used. It is desirable to add one-half per cent of stearic acid for all high-grade rubbers and 1½ per cent for low grade wild and plantation rubbers.

Chemical Patents

United States

1,621,399. PAPER SIZING. A method of coagulating rubber emulsions on paper making fibers. The rubber emulsions are mixed with fibers in the presence of a previously precipitated aluminum hydrate formed by adding a soluble aluminum salt to a soluble alkali.—Judson A. Decew, Mount Vernon, assignor to Process Engineers, Inc., New York, both in N. Y.

1,621,468. AQUEOUS RUBBER DISPERSION AND PROCESS. A water dispersion of rubber is made by dissolving the rubber in a solvent, then mixing it with water in the presence of a soapy vegetable extract. This breaks down the physical structure of the rubber globules. The solvent is finally removed without recoagulating the dispersed rubber globules.—William B. Pratt, Wellesley Hills, assignor to Research, Inc., Boston, both in Massachusetts.

1,621,615. TREATING RUBBER SURFACES. A coating solution for rubber surfaces comprising hypo-sulphite of soda and a softening agent.—George F. Wikle, Milwaukee, Wisconsin, assignor to The Fisk Rubber Co., Chicopee Falls, Massachusetts.

1,622,535. VULCANIZATION PROCESS. The rubber is subjected to vulcanization with the addition of an organic selenium compound as the vulcanizing agent without the addition of sulphur.—Paul I. Murrill, Plainfield, New Jersey, assignor to R. T. Vanderbilt Co., New York, N. Y.

1,622,536. VULCANIZATION PROCESS. The rubber is subjected to vulcanization with the addition of an organic selenium compound together with sulphur.—Paul I. Murrill, Plainfield, New Jersey, assignor to R. T. Vanderbilt Co., New York, N. Y.

1,623,517 PROCESS OF PREPARING RUBBER COMPOSITIONS. Rubber latex is mixed with aqueous suspensions of a deflocculated rubber filler and sulphur, then simultaneously flocculating the filler and coagulating the rubber. Thus a curd-like precipitate is formed containing rubber, filler and sulphur in intimate mixture.—George W. Acheson, Newark, New Jersey.

1,623,522. COATED PAPER. The coating includes at least a layer of pigment, binder and rubber emulsion.—Walter G. Bent, Harrow, England, assignor to Eastman Kodak Co., Rochester, New York.

Dominion of Canada

269,222. ELECTRO-DEPOSITION OF ORGANIC MATERIAL. Depositing organic material on an electro-conducting surface with a substratum which forms a diffusion path for the current. The substratum surface is then brought into contact with an electro-conducting aqueous emulsion of the organic material by passing an electro-depositing current through the surface, substratum and emulsion.—The Anode Rubber Co., Ltd., London, England, assignee of The Eastman Kodak Co., Rochester, New York, U. S. A.

United Kingdom

263,849. WATERPROOFING PAPER, ETC. Waterproof coatings of rubber produced on paper and other fibrous materials by using rubber, balata or gutta percha are caused to adhere strongly to the material by adding resin in a colloidal state to the latex.—H. Quittner, 47 Laudongasse, Vienna, Austria.

263,853. ACCELERATORS. Aldehyde-amine condensation products which may be used in the vulcanization of rubber are obtained by causing one molecular proportion of an amino body to react with two or more molecular proportions of an aldehyde under conditions whereby water is eliminated. The condensation may be carried out in the presence or absence of inert solvents and under ordinary or increased pressure. The water formed in the reaction may be removed by heating or by means of dehydrating agents.—Grasselli Chemical Co., Cleveland, Ohio, assignees of I. Williams and W. B. Burnett, Mellon Institute, of Pittsburgh, Pennsylvania, U. S. A.

263,862. HYDRO-CYCLOCAOUTCHOUC. Caoutchouc is converted into a cyclo compound which is converted into a fully saturated compound by hydrogenation in presence of a catalyst, preferably a metal of the eighth series of the periodic system.—H. Staudinger, 7 Hochmeisterstrasse, Freiburg, Germany.

263,903. ORNAMENTED FABRICS. Textile fabrics, leather, paper, etc., are decorated by applying upon them paste comprising rubber, tannin, and sulphur with or without resin. The paste may be colored by zinc oxide, titanic oxide or by the addition of colors in essential oil or alcohol. The rubber is dissolved in benzene or carbon disulphide and the paste may be applied through stencils and dried by heat.—E. Rodgers, 10 Grosvenor street, Chorlton-on-Medlock, Manchester, England.

264,673. ACCELERATOR. Condensation products of aromatic amines with either croton aldehyde or an alpha-beta-substituted guanadine in vulcanization of rubber.—W. Carpmael, 24 Southampton Buildings, London, England.

264,682. ACCELERATOR. This comprises a mono- or di-carbalkoxy diaryl-thiourea which may be made by the action of thiophosgene on alkylanthranilates, and the crude mixture may be used. The ortho compounds are super-accelerators. These compounds may be heated to a degree comparable to that used in vulcanizing prior to their incorporation in the rubber.—British Dyestuffs Corp., Ltd., 70 Spring Gardens, C. J. T. Cronshaw and W. J. S. Naunton, Crumpsall Vale Chemical Works, Blackley, both in Manchester, England.

265,169. ACCELERATOR. Carbolkoxy thione polysulphides formed by treating salts of xanthic acids with sulphur chlorides are used as vulcanization accelerators. These substances may be used alone as vulcanizing agents, or with sulphur, and with or without an amine, particularly an aromatic amine, as an accelerator.—Roessler & Hasslacher Chemical Co., 709 Sixth avenue, New York, N. Y., assignee of G. S. Whitby, 475 Cote des Neiges Road, Montreal, Canada.

Germany

441,343. Method and apparatus for concentrating latex. General Rubber Co., New York, N. Y., U. S. A. Represented by R. H. Korn, Berlin, S. W. 11.

441,383. Method of producing rubber mixings. Metallbank und Metallurgische Gesellschaft A.-G., Frankfurt-am-Main.

American Rubber Technologists

JOHN R. GAMMETER, mech. engr., *b.* Mar. 27, 1876; public schools Akron, O.; engr. B. F. Goodrich Co., Akron, O., 1896-1927. Developed and patented large number of machines and processes for manufacturing all kinds of rubber goods, especially for aviation, tires, inner tubes, golf balls; in 1927 organized engineering office for development of his own and other inventions for license and sale to the rubber industry. *Member:* All Masonic bodies, Elks, Portage Country Club, Akron, O., Akron City Club, Akron O. *Address:* 680 North Portage Path, Akron, O.

Clifford Wesley Sanderson, chem., *b.* July 3, 1894; Phillipston, Mass.; Cent. High Sch., Springfield, Mass.; B. S., Worcester Poly. Inst., 1916; Fisk Rubber Co., Chicopee Falls, Mass., chem. 1916-1918, chf. chem. 1918-1926, mgr. product develop. since 1926. *Member:* Amer. Chem. Soc.; A. S. T. M.; Soc. Chem. Ind.; Univ. Club, Akron, O, Univ. Club, Springfield, Mass., Chem Club, New York, N. Y.; Oxford Country Club, Lambda Chi Alpha; Appalachian Mountain Club. *Address:* 294 Sumner avenue, Springfield, Mass.

Tod J. Mell, eng., *b.* Oct. 2, 1875, Akron, O.; Akron public schools; tire and development work with the following: Diamond Rubber Co., 1894-1896; B. F. Goodrich Co., 1896-1905; Republic Rubber Co., 1905-1917. Firestone T. & R. Co., 1917-1922; consulting engr. B. F. Goodrich Co., since 1922; inventor of patents on tire construction, rims, repair equipment, rubber mill machinery and processes of rubber goods manufacturing. *Member:* Masonic bodies. *Address:* 885 Bloomfield avenue, Akron, O.

THE INDIA RUBBER WORLD'S brief biographies of American rubber technologists are approved by leaders of the rubber industry because the ambition, imagination and practical accomplishments of these men are largely responsible for America's leadership in the world's rubber manufacturing industry. Technical superintendents, chemists, process and development engineers in rubber manufacturing and reclaiming plants, research, testing and service laboratories are invited to send their biographical data to us for publication.

David John Bonawit, mech. engr., *b.* Brooklyn, N. Y.; M. E. Poly. Inst., Brooklyn, N. Y., 1916; Pyrene Mfg. Co., New York, N. Y., 1916-1917; Ultra Violet Ray Co., South Norwalk, Conn., 1917-1918; Watervliet Arsenal, Watervliet, N. Y., 1918; Q. & C. Co., New York, N. Y., 1918-1921; Atlantic Marine & Const. Co., New York, N. Y., 1922; since 1922, development engr., Manhattan Rubber Mfg. Co., Passaic, N. J. *Member:* Psi Sigma, Am. Soc. Mech. Engrs., Mason, Shriner. *Address:* 3 Orchard Place, Ridgewood, N. J.

Stanley Krall, chem., *b.* Oct. 12, 1894, Detroit, Mich.; East Tech. High School, Cleveland, O.; B. S. Case Sch. Appl. Sci., 1916; research chem., Firestone T. & R. Co., Akron, O., 1916-1924; development mgr., Mason T. & R. Co., Kent, O., 1924-1926; chem. since 1926, Fisk Rubber Co., Chicopee Falls, Mass. *Author:* Patents and papers on rubber technology. *Member:* Sigma Nu, Alpha Chi Sigma, University Club, Springfield, Amer. Chem. Soc. *Address:* Fisk Rubber Co., Chicopee Falls, Mass.

Harold Philip Partenheimer, engr., *b.* Aug. 30, 1891; Greenfield High School; A. B. Amherst Coll., 1913; Columbia Univ., Fisk Rubber Co., Chicopee Falls, Mass., product devel. dept., construction div., since 1917. *Member:* Phi Kappa Phi, Sigma Xi. *Address:* 1384 Page blvd., Springfield, Mass.

George Leonard Lawrence, civ. engr., *b.* July 1, 1887, Dorchester, Mass.; S. B. civ. engr., M. I. T., 1909; engineering work states of Mass. and N. Y. until 1910; W. H. McElwain Co., (shoe mfrs.), 1911-1914; asst. supt., supt., fact. mgr. and prod. mgr., Boston Rubber Shoe Co., (U. S. Rubber Co.) Malden, Mass., 1915-1922; since 1922 fact. mgr. Tyer Rubber Co., Andover, Mass. *Author:* Lectures on rubber at M. I. T. and at U. S. Rubber Co. factories; technical papers and patents. *Member:* Masons, Omicron Delta. *Address:* 40 Orient avenue, Melrose, Mass.

Emory Thompson Miller, engr., *b.* Sept. 18, 1879, Louisville, Ky.; Manual Training High, Louisville, Ky.; B. S. mining eng., Lehigh Univ., S. Bethlehem, Pa., 1903; Bethlehem Steel Co., Bethlehem, Pa., 1903-1906; United Fruit Co., 1907-1910; Phelps-Dodge Co., 1912-1913; Lehigh Coal Nav. Co., 1916-1920; Woodward Iron Co., 1920-1922; since 1922 engr. Manhattan Rubber Mfg. Co., Passaic, N. J. *Member:* Amer. Inst. Mining & Met. Engrs., Amer. Soc. Agric. Engrs., Amer. Petroleum Inst. *Address:* Manhattan Rubber Mfg. Co., Passaic, N. J.

Cyrus Field Willard, research chem., *b.* Aug. 17, 1858, Lynn, Mass.; Eng. High School, Boston, Mass.; editorial staff, "The Boston Globe"; research in colloidal chemistry in Calif. since 1910; patented rubber reclaiming processes, resinous product, devulcanizing kettle, etc.; pres. Willard Foundation, incorporated 1927; editor, "The Master Mason," San Diego, Calif. *Member:* Committee on Masonic Education, Grand Lodge of Calif. *Address:* 621 West Ivy street, San Diego, Calif.

Allen Otis Zimmerman, chem., *b.* July 29, 1893; Ortonville, Mich.; Ortonville and Oxford High Schools, A. B. chem. Albion Coll., Albion, Mich., 1916; post. grad. chem. engr., Univ. Mich., 1917; asst. in chem. eng., Univ. Mich., 1916-1917; development dept., Goodyear T. & R. Co., Ltd., Australia, since 1917. *Author:* co-author with R. P. Dinsmore, "Effect of Accelerators on Cure and Quality of Various Rubbers," "Cure Criteria." *Member:* Sigma Nu, Am. Chem. Soc., Mason. *Address:* 1751 Preston ave., Akron, O.

Harold A. Flannery, mech engr., *b.* April 3, 1894. Horseheads, Chemung County, N. Y.; A. B. Cornell Univ., Ithaca, N. Y., 1917; tire design div., develop. dept., Goodyear T. & R. Co., Akron, O. *Address:* 128 Boston avenue, Akron, O.

William Harold Fleming, mech. engr., *b.* Feb. 4, 1891, Paint Valley, O.; Univ., Akron, O.; S. B. mech. engr. M. I. T., 1916; production engr., 1917-1919; genl. foreman, 1920-1923; mgr. materials control dept., 1924-1926; div. supt. since May, 1926. *Author:* "Goodyear Materials Control." *Member:* Exchange Club, Akron, O., Delta Tau Delta, Theta Tau Eng. Soc. and Lone Star fraternity. *Address:* P. O. Box 4, Akron, O.

Herman E. Morse, mech engr., *b.* Nov. 16, 1893, East Bridgewater, Mass.; B. S. mech. engr. M. I. T., 1915; continuously with Gooyear T. & R. Co., since 1915 as follows: gen. tire plant, 1915-1916; mech. goods plant lay-out, 1916-1918; prod. dev. molded goods, 1918-1919; charge of design all mech. goods, heels, soles, 1919-1920; since 1920 mgr. mech. goods develop., soles, heels, flooring; inventor of design and construction patents. *Member:* Masons, Masonic Club, Univ. Club and Fairlawn Club, all of Akron, O. *Address:* 730 Wellesley avenue, Akron, O.

Robert L. Moore, chem., *b.* Jan. 1895, Meadville, Pa.; B. S., Allegheny Coll., 1917; asst. chem., Falls Rubber Co., Cuyahoga Falls, O., 1917; sg't. C. W. S. Am. Univ. Expt. Station, Washington, D. C.; 1918, asst. chem. Rubber Division, Bu. of Std., 1919-1920; Continental Rubber Works, Erie, Pa., 1920-1921; asst. chf. chem. Thermatomic Carbon Co. since 1921. *Joint author:* Bu. of Std. Tech. Paper No. 154 "Determination of Cellulose in Rubber Goods," "The Effect of Milling on Rubber Stocks," "The Distribution of Carbon Black in Rubber," "High and Low Stiffening Carbon Blacks." *Member:* Am. Chem. Soc., Alpha Chi Sigma, Phi Kappa Psi, Mason. *Address:* 108 Ferry street, Pittsburgh, Pa.

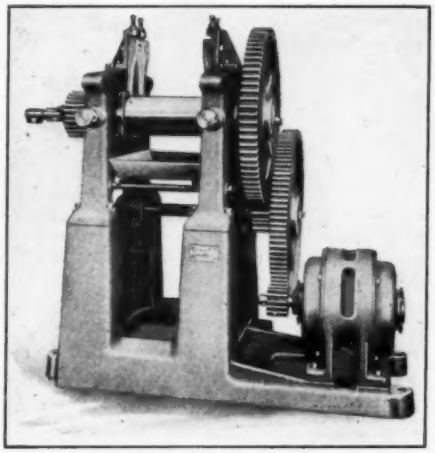
Allen Goodwin McKinnon, chem. *b.* Feb. 18, 1894, Manchester, Mass.; Brown Univ., Providence, R. I., 1912-1913; B. Sc. chem. and math., Boston Univ., Boston, Mass., 1917; asst. chem., Oil, Paint & Var. Co., Everett, Mass., 1917; chf. chem., Boston Rubber Shoe Co., Malden, Mass., 1918-1922; chem. C. W. S., Am. Univ., Washington, D. C., 1919; since 1922 chf. chem. Tyer Rubber Co., Andover, Mass. *Author:* "Quicker Method for Fire Sulphur Determination in Rubber Goods"; lecturer, Boston Univ., 1919-1926. *Member:* Am. Chem. Soc., Masons, Capt. Officers Reserve Corp, C. W. S. *Address:* Tyer Rubber Co., Andover, Mass.

Morris L. Weiss, chem., *b.* Jan. 8, 1887, Russia; Russian secondary schools; Temple Coll., Phila., Pa., 1906-1907; Cooper Union, New York, N. Y., 1908-1913; B. S. chem., Poly. Inst., Brooklyn, N. Y., 1913-1916; asst. biochem., Harriman research lab., Roosevelt Hospital, New York, 1917-1920; since 1920 chf. chem. director research and vice pres. Dovan Chemical Co., New York, N. Y. *Inventor:* Patents on disubstituted guanadine accelerators and others; process patents. *Member:* Am. Chem. Soc., Soc. Chem. Indus. (London), German Chem. Soc. *Address:* 441 Riverside avenue, Newark, N. J.

New Machines and Appliances

R. A. Laboratory High Level Mill

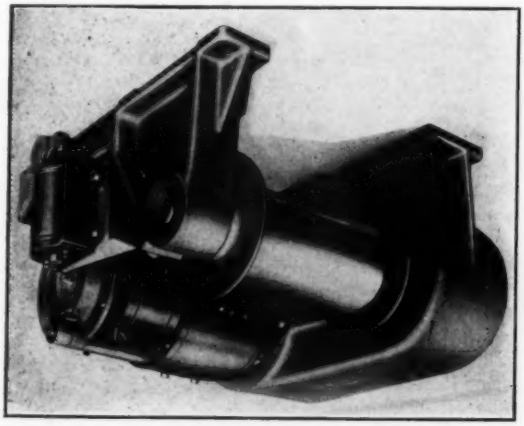
A NEW experimental mixing mill for laboratory use is here pictured. It is designed with a view to occupying the least possible space and to bring the rolls to the most convenient working level. The latter point is accomplished by mounting the mill frames upon a high pedestal base, a side extension of which is used as the foundation for the motor. The rolls are 6 inches in diameter by 12-inch face and are of the highest grade of chilled iron. All the gears are cut spur tooth type and fully guarded although in the illustration these are removed to show the details of their arrangement. The bearings are well babbitted. Adjustable guides are provided to prevent escape of the mixing and ingredients from the ends of the mill rolls. A neat steel pan is removably supported beneath the rolls on the housing tie rods.—The Adamson Machine Co., Akron, Ohio.



Adamson Experimental Mill

Electric Hoist

All sorts of hauling and lifting that can be done with a hoist in a fixed position can be done with the electric hoist here pictured. It can also be mounted on skids and used as a portable hoist.



Lo-Hed Electric Hoist

The standard machine consists of a smooth drum driven by a motor through a train of spur gears, all mounted on a common bed plate. According to its size, it will handle loads from 500 to 4,500 pounds. Gears are completely enclosed, heat treated and run in oil. The gear shafts run in roller bearings. The motor is fully enclosed and ball bearing. The controller is of the single speed reversing drum type.—American Engineering Co., Philadelphia, Pennsylvania.

Rubber Densimeter

In the laboratory, testing department, and shop generally, there is almost constant use for a handy and reliant instrument for measuring relative hardness of rubber stocks. A scientific instrument for determining the density of rubber in accordance with a standard scale is here illustrated. The picture shows the manner of holding and applying the instrument to a sample.

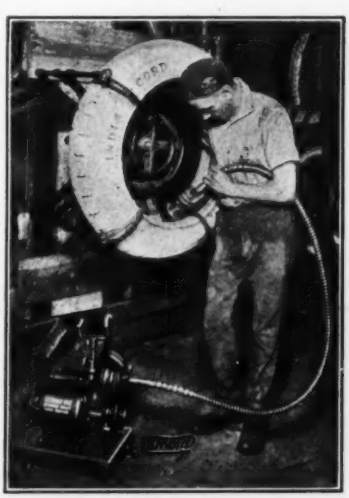
Adams Densimeter

Through the base of the instrument a rounded steel point protrudes. This point is pressed against the rubber to be tested until the base of the instrument bears on the rubber surface. At this point the degree of hardness is read from the dial. This reading multiplied by two gives the plasticity as shown by the well-known plastometer, which is the standard scale used in this and other countries.

While this densimeter was designed primarily for measuring the density of paper machine and other rolls it is equally well adapted for use on any molded or heavily covered rubber article.—Stowe & Woodward Co., Newton Upper Falls, Massachusetts.

Flexible Shaft Tire Buffer

An effective means for buffing tires is quite indispensable in a vulcanizing shop or in the mold cleaning department of a tire factory. One of the most practical and durable of this type of portable power tool is the flexible shaft buffer here illustrated. The special feature of this machine is its flexible shaft which consists of a number of layers of the very highest quality music wire accurately wound alternately in opposite directions. With this machine a large variety of wire scratch brushes and rotary files, rasps and grinding wheels can be used for cleaning flat or curved surfaces rapidly and thoroughly. The machine is especially suited for buffing balloon and large size tires and molds.—N. A. Strand & Co., 5001-5009 North Lincoln street, Chicago, Illinois.

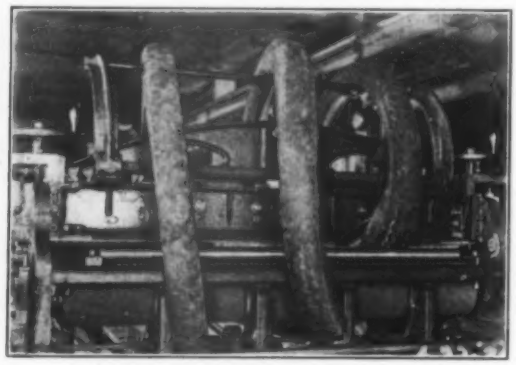


Strand Tire Buffer

Scrap Tire Splitting Machine

A new recruit in the rubber reclaiming industry is here depicted. It is a leather splitting machine with certain adaptations fitting it for cutting treads from scrap tire casings and for splitting apart the duck plies. The illustration of the head of the machine shows three debeaded tires, the two at the left being simply thrown over the head to be handy for the operator, while the third is passing under the splitting knife.

The tire at the right is being opened and spread flat by a special device as it enters the rolls preparatory to being split by the knife



Turner Rubber Splitter

of special quality, which is not within view. The picture also does not show the special feeding device which is very important in handling tires. A so-called Chilson attachment has for its object the automatic regulation of the knife grinder and adjustment of the knife. There is a clutch on the main driving shaft directly at the right of the operator. If the machine becomes choked by the entering stock the operator, by a quick motion of his hand, can promptly stop the feed while the knife will continue running unless the entire machine is shut down.—The Turner Tanning Machinery Co., Peabody, Massachusetts.

German Brake Band Machine

The illustration represents a German machine adapted for calibrating asbestos brake lining to gage before curing. The two calibrating disks correspond with the thickness of the bands and are adjustable to any gage desired. A scale is arranged to indicate the calibration. The upper pressing roll is adjusted by spindles operated by movement of the disks. The rolls and disks are made of hardened metal.—Nienburger Maschinenfabrik, A. G., Nienburg am Saale, Germany.

Brake Band Calibrator

Mixing Battery

Many forms of mixers and agitators have been designed for dissolving and mixing materials such as rubber cements, etc. In this connection a most practical group of heavy duty cement churns or mixers are built either in single units or gangs for handling stock in heavy masses. When arranged as a gang each mixer is supplied with its own clutch so that it may be operated or stopped independently. The tanks may be either of steel or wood, covered or uncovered, and the agitators for light or heavy duty.—The Patterson Foundry & Machine Co., East Liverpool, Ohio.

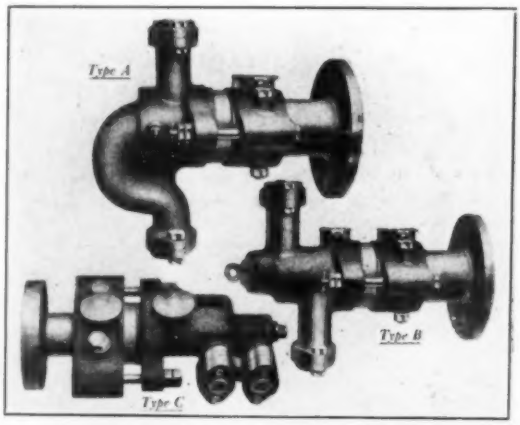
Improved Gravity Balance

The well-known gravitometer of Young has been improved in line with the demand for greater accuracy. The improved instrument is much more sensitive than formerly, due to the wide swing of the index arm and change in the method of supporting this arm on a much longer pivot which reduces damage to the pivot point. The instrument is now equipped with an electric vibrator for insuring correct centering of the beam. It also has a quick operating elevating platform. The gravitometer for solids gives direct readings of specific gravity ranging from 0.85 to 10.00 and is accurate to the second decimal place between 0.85 and 2.00. No weights or calculations are required and the operation is extremely simple.—Eimer & Amend, Third avenue and 18th street, New York, N. Y.

Young's Improved Gravitometer

Packingless Steam and Water Connections

The illustrations represent three types of packingless connections designed for steam and water connections for rubber mills and calenders. Type *A* is suitable for mixers, warmers and refiners, while types *B* and *C* are for calenders. Each type is thus adapted for special service conditions.

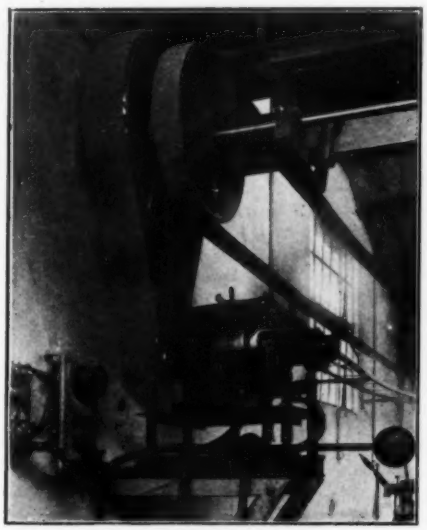


Kempster's Steam and Water Connections

The principal feature of these connections is the entire absence of packing, all joints being specially machined. An ingenious system of lubrication keeps the joints constantly covered with a thin film of oil which reduces friction to a minimum and keeps them perfectly steam and water tight. The makers claim they will remain tight for years with no other attention than occasional oiling. In consequence of there being no leakage of steam or water the efficiency in the heating and cooling of calender and mixing rolls is under perfect control.—David Bridge & Co., Ltd., Castleton, Manchester, England.

Electric Motor Tension Base

The tension motor base recently introduced from Europe possesses marked advantages in promoting smooth, vibrationless operation of electric motors. It consists of a movable platform upon which the motor is mounted. At each corner it is supported by steel springs whose tension is adjusted to suit the operating conditions. To the center of the platform is fastened a rack passing downward and engaging a pinion mounted on the base of the main frame. On the outer end of the pinion shaft is mounted a lever carrying an adjustable counter-weight to balance the motor on the platform. The action of the lever and its counter weight, by virtue of the upper and lower supporting springs, produces a constantly uniform tension



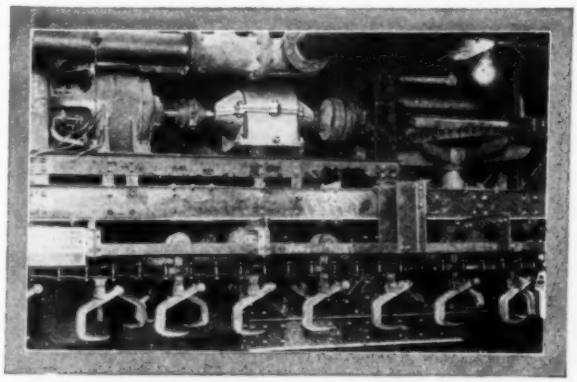
Nilson-Miller Motor Base

on the driving belt. This is adjustable at will and all irregularities are entirely absorbed by the tension base.—Nilson-Miller Corp., 1300 Hudson street, Hoboken, New Jersey.

Mill Type Speed Reducer

The modern scientific method of providing an individual power plant for each machine is admirably met by the mill type speed reducer, which is here shown driving a tire water bag conveyer.

This machine is very simple and rugged in design, employing large through shafts supported in bearings at both ends, and extra



Palmer-Bee Improved Speed Reducer

large wide face spur gears. Its assembly is straight line for mounting on a common bed plate with the motor. The gears are cut from forgings or from electric steel castings. The pinions are of high carbon hardened steel. The bearing caps are independent of the casing, allowing removal of the cover without disturbing the bearings. The lubrication is a patented oil bath, splash and gravity feed system, assuring an ample supply of oil to all friction surfaces. The entire mechanism is enclosed in an oil-tight, dust-proof casing.

These efficient and durable reducers are in use in rubber mills in all parts of the country for driving conveyers, handling molds and tires in all departments of their production.—Palmer-Bee Co., Detroit, Michigan.

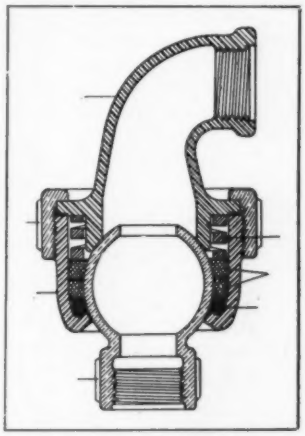
Metal Air Craft Pressings

The use of rubber as a filler or forcer, in place of a liquid, in cases where hydraulic dies may be used is well known. The method, however, has only recently been developed to make large pressings in such shapes as those for airplane wing ribs, gasoline tanks, etc. In brief, the method consists in using in a press a single die with sheet rubber in place of a second matched die.

According to Commander R. D. Weyerbacher, chief engineer, Naval Aircraft Factory, the method presents the following advantages: A single die only is needed. This die may be of wood, metal or other material, depending upon the amount of use it is to have. The die may be made in the most reasonable of a number of ways to adapt it to the work in hand. That is to say, it may be cast, built up, or machined. It requires to be finished only to the tolerances and with a smoothness required in the completed article and no fitting of dies is required.—*Automotive Industries*, April 16, 1927.

Flexible Ball Joints

It is characteristic of rubber plant equipment that many of the machines and appliances used in such plants have been adopted from other industries. Transportation equipment furnishes the latest idea in flexible joints for vulcanizer presses in the rubber manufacturing field. The sectional view of this joint shows its ball and socket construction. Its long life is due to the special packing surrounding the ball, and the spring follow-up feature which constantly compensate for wear and hold the joint non-leakable.



Foster Flexible Joint

These joints have been in service for 18 months at a time, supplying steam to and removing drainage from vulcanizing presses, without need of attention or replacement. They are made in all sizes and in addition to being used for steam and water are also suitable for air, oil, gasoline, etc.—Foster Engineering Co., 109 Monroe street, Newark, New Jersey.

Machinery Patents

Dominion of Canada

269,234 Tire machine. The Fisk Rubber Co., Chicopee Falls, Massachusetts, assignee of George F. Wikle, Milwaukee, Wisconsin, both in U. S. A.

269,354 Tire mold. Pierre Louis Menjou, Paris, France.

269,506 Vulcanizing device. Alfred Edward Burch, Melbourne, Victoria, Australia.

269,635 Mill roll. The Goodyear Tire & Rubber Co., assignee of Elmer Clark, both of Akron, Ohio, U. S. A.

269,637 Tube deflating machine. The Goodyear Tire & Rubber Co., assignee of Raphael S. Kirk, both of Akron, Ohio, U. S. A.

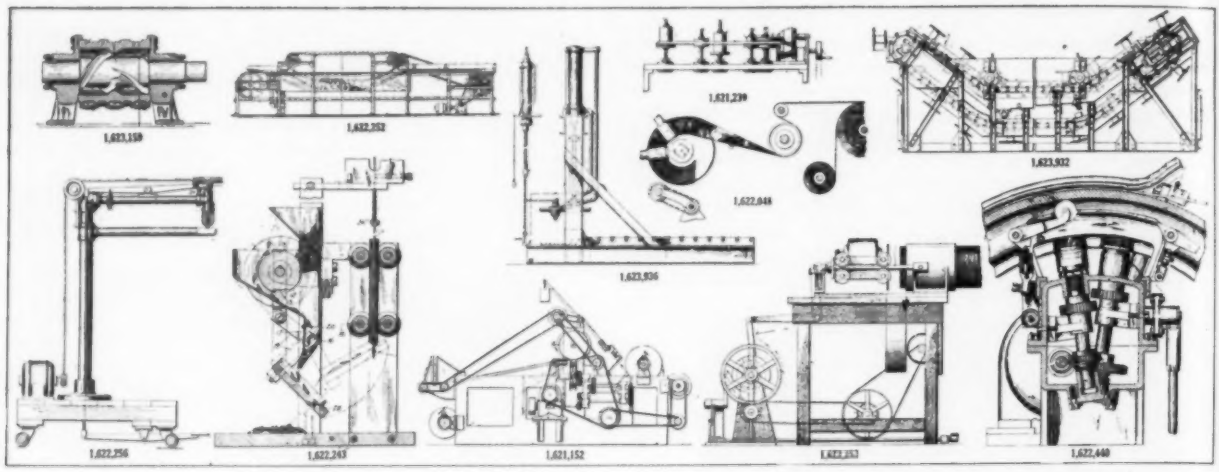
United Kingdom

263,870* Vulcanizing device. T. Dürst, Paris, France.

264,221 Wrapping machine. T. Sloper, Southgate, Devizes, Wiltshire.

265,056 Mixing machine. R. C. Lewis, and Farrel Foundry & Machine Co., both of Ansonia, Connecticut, U. S. A.

* Not yet accepted.



United States

1,621,152. BIAS CUTTING MACHINE. Fabric to be cut on the bias is smoothly delivered to a platen roller without slipping, while passing over the roller the fabric is cut on the bias by an endless series of moving cutters traveling lengthwise of the roller and impinging against its surface. The fabric is prevented from wrinkling in passing the cutting roll or being displaced upon it by the action of a helicalically corrugated smoothing roller and a puller roller which places the fabric under tension on the platen roller.—James W. Brundage, assignor to The Miller Rubber Co., both of Akron, Ohio.

1,621,239. APPARATUS FOR COVERING TIRE BEADS. This machine is designed to apply the covering or flipper strip of fabric to a tire bead quickly and accurately. The bead is revolved horizontally and guided by a number of vertically placed rollers supported on a horizontal bed plate. The functions of the rollers are to support and guide the bead and the fabric ready for the final shaping and covering operation. This is performed as the bead and fabric pass between two horizontally arranged feeding and covering rollers with surfaces so formed to apply the fabric to the contour of the bead.—H. A. Denmire, assignor to The General Tire & Rubber Co., both of Akron, Ohio.

1,622,048. MACHINE FOR MAKING LAMINATED DISKS. An annular, laminated structure is formed by winding a strip of bias-cut rubberized fabric upon a form in such manner as to provide a non-cylindrical structure approximating the form desired in the finished article. It is then molded to shape and vulcanized for use as a connecting disk in a power transmission joint.—Robert M. Pickson, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,622,243. HEEL WASHER STACKING MACHINE. Concave heel washers first pass from the hopper of the machine to a distributor roll and are discharged through the orifice of the hopper flatwise onto a swingable plate. The washers slide down the plate and those that drop convex side down are caught in singly by a selector pocket, while the others drop off the plate. The upward motion of the swingable plate forces the washer retained in the selector pocket over the spring point upon a vertical wire building up a string of washers.—George G. Andrews, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio.

1,622,252. DEVICE FOR TESTING INFLATABLE ARTICLES. Inflated inner tubes to be tested for leakages are conveyed downward into and upward out of a tank of water by motor driven chain conveyers. In that portion of the travel which lies below the surface of the water the tubes are kept submerged by traveling forward between an upper and a lower conveyer.—Max H. Pade, assignor to The Firestone Tire & Rubber Co., both of Akron, Ohio.

1,622,253. MACHINE FOR CUTTING FAN BELTS. This is particularly designed for cutting narrow fan belts for automobiles from large cylinders of rubberized and vulcanized fabric. The vulcanized cylinder to be cut into narrow rings or belts is fed through a neatly fitting cylinder. The cutting is effected by a cam actuated knife which is projected outwardly, cutting the cylinder from its inner surface.—Edward D. Putt and Horace D. Stevens, assignors to The Firestone Tire & Rubber Co., both of Akron, Ohio.

1,622,256. VALVE HOLE PUNCHING MACHINE FOR INNER TUBES. This portable machine comprises a standard carrying two side brackets, the lower of which is provided with an end of hard wood serving as an anvil against which the cutting tool operates. The upper arm supports a lever, one end of which is connected by a rod to a foot treadle under the platform of the machine, while its opposite end serves to depress the cutting tool attached to a vertical reciprocal and rotary shaft. These moving parts are actuated by a motor with belt connection.—Horace D. Stevens, assignor to The Firestone Tire & Rubber Co., both of Akron, Ohio.

1,622,440. TIRE TRIMMING APPARATUS. A pneumatic tire casing is supported internally and revolved within its own plane for trimming away its rind or mold overflow at center of the tread and edges of the bead. The tread overflow is cut away by a chisel edge tool applied as the tire revolves. The edges of the beads are trimmed by rotary shears operating on them as the casing is spread apart.—John R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,623,159. MACHINE FOR MIXING OR MASTICATING RUBBER. This is an internal mixer for rubber or similar plastic material, so designed as to greatly reduce slippage of the mixing material against the inside walls of the mixing chamber and thus hasten the mixing operation.—David R. Bowen, Ansonia, and Carl F. Schnuck, New Haven, assignors to Farrel Foundry & Machine Co., Ansonia, all in Connecticut.

1,623,932. MACHINE FOR TESTING POROSITY OF INFLATABLE ARTICLES. Endless chain conveyers are arranged on each side of a testing tank, and carry adjustable drums over which partly inflated inner tubes are placed. Divergent cam tracks separate the drums as they pass under the water, causing the tube to stretch and thus reveal the presence of any porosity in their structure.—William Stephens, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio.

1,623,936. BALE TEARING MACHINE. In this machine a bale of crude rubber is clamped by hydraulic pressure against a horizontal platform. A layer of rubber is then ripped from one side of the bale by a pulling force applied to a hook connected with a suspended air-hoist. In this way the rubber layers are successively separated from the bale without manual labor.—Fred Colley, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio.

1,621,000 Method and apparatus for vulcanizing rubber packing upon a cylindrical article. John C. Crowley, assignor to The Dill Manufacturing Co., both in Cleveland, Ohio.

1,621,114. Molding machine. Walter J. Irvin, Akron, Ohio.

1,621,587 Branding. Daniel E. Hennessy, Milwaukee, Wisconsin, assignor to The Fisk Rubber Co., Chicopee Falls, Massachusetts.

1,621,595 Vulcanizing apparatus. Joseph F. Mincher, Milwaukee, Wisconsin, assignor to The Fisk Rubber Co., Chicopee Falls, Massachusetts.

1,621,958 Vulcanizer. Lewis O. Snare, Toledo, Ohio.

1,622,077 Apparatus for making heels. John J. Batterman, Brookline, assignor of one-half to John J. Daly, Newton, both in Massachusetts.

1,622,257 Tube stock cutting apparatus. Horace D. Stevens, assignor to The Firestone Tire & Rubber Co., both of Akron, Ohio.

1,622,418 Sole pressing apparatus. Thomas Edwin Cann, Leicester, England.

1,622,438 Apparatus for vulcanizing under fluid pressure. Roy D. Fritz, Barberton, Ohio, assignor by direct and mesne assignments to The B. F. Goodrich Co., New York, N. Y.

1,622,468 Tire spreader. Elmer H. Schaeffer and David Apfel, Reading, Pennsylvania.

1,622,661 Tire spreader. William A. Mielke, Bancroft, Nebraska.

1,623,183 Vulcanization. Daniel E. Hennessy, Milwaukee, Wisconsin, assignor to The Fisk Rubber Co., Chicopee Falls, Massachusetts.

1,623,208 Machine for stripping vulcanized articles. Chester J. Randall, Woonsocket, Rhode Island, and Charles Wurtenberg, Union City, Connecticut, assignors to The Goodyear's Metallic Rubber Shoe Co., Naugatuck, Connecticut.

1,623,677 Vulcanizing apparatus. James C. Heintz, Lakewood, Ohio.

1,623,730 Horizontal bead flipper. Edward Hutchens, Milwaukee, assignor to Utility Manufacturing Co., Cudahy, both in Wisconsin.

1,623,933 Apparatus for and method of making articles from a fibrous composition. Paul Beebe, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio.

Germany

441,497 Device for testing rubber belting. Hugo Bondy. Represented by Dr. A. Mestern, Berlin, S. W. 48.

Designs

Germany

980,981 Apparatus for producing strips for winding golf balls and the like. Dunlop Rubber Co., Ltd., London. Represented by, Dr. R. Wirth, C. Weihe, Dr. H. Weil, M. Wirth, of Frankfurt-am-Main, and T. R. Kcehnhorn and E. Noll, Berlin, S. W. 11.

982,015 Vulcanizing heater for automobile and bicycle tires. Brunotte & Niemeyer, Brink vor Hannover, Post Langenhagen.

Process Patents

United States

1,622,340 Curing rubber hose and the like. Charles H. Paeplow, Buffalo, New York.

1,622,546 Splicing solid tire stocks. George W. Seiberling, assignor to Morgan & Wright, both of Detroit, Michigan.

1,622,601 Golf ball. Thomas W. Miller, Ashland, Ohio.

New Goods and Specialties

The Season's Newest Offerings for Stormy Days

Alligator Grained Cloth

EACH season brings changes in style and color for inclement weather garments, one being as conscious of the last year's cut of a raincoat as of a coat or suit or gown.

A new offering from E. I. Du Pont de Nemours & Co., Fairfield, Connecticut, is a two toned, embossed material known as the Alligator Grained Du Pont Fairfield fabric. It is made in two weights, lightweight for raincoats and a flannel backed grade for sport wear. The raincoats will be made exclusively by the Harris Raincoat Co., New York, N. Y., and will be marketed under the trade name of Everglade; while the flannel backed leatherette grade will appear under the trade name of Leathacoat and will be a product of Max Hyman & Son, New York, N. Y.

Blazer

The striking color of the Blazer slicker will help to establish it in favor with the younger element who delight in daring color combinations for gloomy days. The coat is fashioned from a very light weight rubberized fabric, soft and cool, and the raglan sleeves make it roomy and comfortable. The collar is lined with gray corduroy and the slicker trimmed with colored pearl buttons. These coats are marketed by the Ben Fligel Co., 25 West 31st street, New York, N. Y.

The Standard Student slicker is manufactured by the Standard Oiled Clothing Co., New York, N. Y., and distributed by the Excello Co., 225 Fifth avenue, New York, N. Y. The coats are made for both men and women in three shades—yellow, olive and black. They are guaranteed water and windproof.

Standard Student

Rain Suit

A two piece suit of rubberized fabric is the novel idea of the M. Vandewart Corporation, 10 East 33rd street, New York, N. Y. The skirt is the wrap-around type and fits snugly and smoothly over a skirt or dress, a row of snaps making it easy to adjust. A Norfolk coat is full cemented, modish and comfortable. The complete outfit includes a hat and bag to match and is supplied in rubberized plaids and mottled rubber.

The Badger Raincoat Co., Port Washington, Wisconsin, is showing one of the most attractive styles for misses, the Trench coat, which may be used for general sport wear, as well as for rainy days. It is made with raglan sleeves, convertible collar and belted. The fabric has all the appearance and feel of leather. Another new model from the same manufacturer is the All-weather coat for men, a flannel lined, sturdy garment made in triple ply—shell, rubber and lining. It is well tailored and smartly designed, forming ample protection against cold, wind and water. The large roomy patch pockets, three piece detachable belt and convertible collar are replicas of the newest models in overcoats.

The young children are not forgotten when new styles in waterproofs are designed, the Leatherette sport model pictured conforming in every detail with garments for the older girls. These coats may be worn as topcoats or raincoats and are made by the Norman Rubber Co., Inc., 252 West 38th street, New York, N. Y. Models are made in seven colors.

Trench Coat

Child's Leatherette

A light weight raincoat suitable for the warm summer months has been announced by the Clifton Manufacturing Co., Jamaica Plain, Boston, Massachusetts, and is listed under the trade name of Japtex. It is made of a special rubberized silk fabric and can be had in three colors: azure blue, Miami rose and jade green. The Japtex coat follows the slender fashionable lines of the moment, for raincoats now must conform to the newest cut in coats, and rainy day apparel present as fashionable an appearance as less utilitarian costumes.

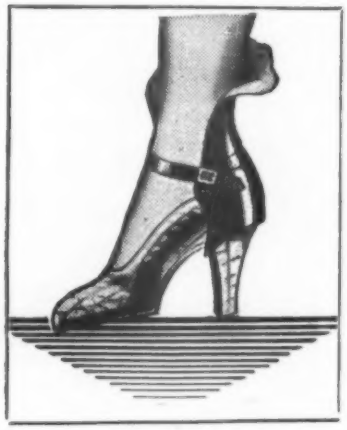
Japtex

Rubber Toothpick

In order to free the hands for other and more sightly tasks, a western man has invented a rubber toothpick that works from the inside. It resembles a good-sized carpet tack, the flattened point being of hard rubber vulcanized to a soft, slightly cone-shaped base which can by suction be attached to the tip of the tongue. It is said that it can be used effectively and noiselessly in the most polite society without risk of ostracism, provided the user keeps his mouth shut while operating the rubber armored "unruly member."

Stocking Protector

Quite as important as the raincoat is the stocking protector, a necessity with the new shades of hosiery. I. B. Kleinert



Splash-Guard

Rubber Co., 485 Fifth avenue, New York, N. Y., has designed a new type, the Splash-Guard, which will not make the ankle appear ungainly and unsightly. It is made in the newest color combinations of a specially treated waterproof fabric.

Spat Clog

One of the newest features in the Dominion Rubber Co., Ltd., Montreal, Canada, line is the Spat Clog to wear with spats or gaiters. In the past many good dressers who favored spats stopped wearing rubbers because they could not get a suitable rubber that would fit perfectly when spats were worn. The Spat Clog is made over specially designed lasts affording neat fitting qualities at the shank thus overcoming the tendency to gape at that point. The Spat Clog is shown on the Bermuda and Bond lasts for men.

This company is also introducing the Rain-Slipon, a cotton jersey woman's overshoe made in black, gray and fawn. Another new model is the Gypsy, also a high-grade wool jersey overshoe made in black only.

Heel Shield

The life of a silk stocking may be prolonged by the use of the Naiad heel shield, the rubber in the shield preventing the acid perspiration from attacking the silk. To secure the shield, turn the hose wrong side out, slipping a card inside for use as an ironing board. Place the shield on heel and press with warm iron, the hose may be washed in the usual manner and the shield will not come off. It cannot be seen on the right side of the hose.—The C. E. Conover Co., New York, N. Y.

Lady Edison

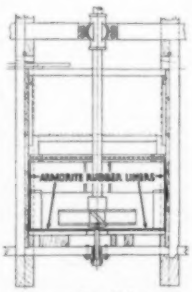
Naiad Shield

Cover for Exposed Joints

The rubbing and grinding effect of road grit that has adhered to grease intended to lubricate is the cause of 90 per cent of the wear on exposed joints on motor cars and motorcycles. The Desmo Flexi Lubri Cover is designed to eliminate this wear and joints fitted with this device may be left unattended, according to the manufacturer, for a season's running. Produced in rubber, the cover insures absolute grease retention, a perfect union being secured by the tongue and groove connection between the two centers, yet permitting free moving of the joint. It is simple to fit to any part of the car, and renders unnecessary the weekly greasing and oiling.—Desmo, Ltd., Stafford street, Birmingham, England.

Rubber Liners in Flotation Cells

Flotation cells are lined with Armorite, a soft rubber compound of extreme durability under severe wear, which solves the problem of attaching rubber to metal or wood surfaces so that it stays "put." The capacity of rubber to resist abrasive wear has been well known for many years, but advantage could not be taken of this useful property because of the difficulty of securely uniting soft rubber directly to metal. This new method is based on the principle by which rubber penetrates and locks itself during vulcanization into the pores of the metal or other substance. —The B. F. Goodrich Co., Akron, Ohio.



Armorite Liners

Rubber-All

Complete protection in the stormiest weather can be assured with the rubber-all garment as these suits are made of a double texture cloth with a sheet of pure rubber between layers. A collar may be converted into a hood for protection of the neck and head. The suit is opened or closed quickly by means of a hookless fastener, no buttons or hooks to come out, simply pull the slider and the garment is secure. The manufacturer is The Rubber-All Co., 35 West 25th street, New York, N. Y.

Molded Rubber Animals

Novel little rubber animals which emit a squawk when pressed are offered by "Vulkan" Gummiwarenfabrik Weiss & Baessler, A.-G., Berlin W. 35, Germany. They are made of heavy gage dipped goods

Squawking Cat and Duck

from which the edges are rolled back, after removal, and sealed with calendered stock to which the novel squeaker is attached. This consists of a thin reed or tongue fastened to a semi-cylindrical open tube, the fixed end of the reed being shellacked into a bit of pure gum tubing, the latter serving as an attachment to the inside of the base of the toy. When compressed the animal emits a peculiar noise very different from the noise usually employed. The toys are featured with appropriate colors, presenting an attractive appearance.

Canned Tennis Balls

An innovation in the packing of tennis balls has recently been announced by The Pennsylvania Rubber Co., Jeannette, Pennsylvania. The balls are taken immediately at the moment of manufacture, when perfectly fresh and lively, and packed three balls in a metal tube. Into this tube is forced air pressure equal to the internal air pressure in the balls, and the tube is then hermetically sealed. The air pressure in the balls cannot escape, and they are sure to be as fresh and lively when the tube is opened as on the day they were packed. Balls packed by this method have been held for more than two years, and are said to have been in perfect playing

condition when the tube was opened. A distinct advantage of this method of packing is that it permits the dealer to order

his entire year's supply in one shipment, without fear of the balls not being up to the standards of liveliness demanded by players.

Self Inflating Belt

Designed on scientific principles, the self inflating life belt is a boon to the sea traveler and non-swimmer. It weighs less than one pound, folds compactly when not in use, and will sustain the wearer in deep, rough water. The belt is thirty times lighter than its cubic contents of water. It is hollow ribbed and is easily and quickly adjusted to the body.—Self Acting Life Belt Corporation, 55 East 8th street, New York, N. Y.

Safety Equipment

Safety, comfort and economy are combined in the new Super-Drednaut goggle

Super-Drednaut Goggles

designed by The Safety Equipment Service Co., Cleveland, Ohio. The material from which the goggle is made is light, durable and sanitary—it can be sterilized in boiling water. The design of the cup is such that it fits any face comfortably, and the lenses are interchangeable by merely unscrewing the top cap or retaining ring. The lenses themselves are of toric form and are made from optical glass, which has been specially treated to render them almost unbreakable. A ¼ pound ball dropped from a height of three feet very rarely shatters the glass, the toric form, of course, due to its arching effect adding considerably to its strength. The head band, ⅛ inch wider than usual, can be adjusted to length and is made of a special grade of rubber that will withstand sterilizing.

Rubberib Battery

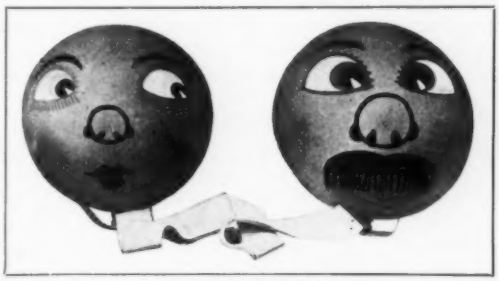
An improvement announced by The Prest-O-Lite, Inc., Indianapolis, Indiana, strengthens and prolongs the life of the battery by triple reinforcing separators of Port Orford cedar with strong vulcanized rubber ribs. These ribs act as effective buffers between the wood separators and the metal plates, providing the most vulnerable part of the battery with the ability to outwear the plates themselves. The ruggedness and strength of the separators between the positive and negative plates is the biggest factor in the life of the battery, therefore this improvement in the separators means a corresponding improvement in the batteries.

Valve Seat Tester

This device consists of an inverted cup having a rubber ring at the bottom and a pressure gage mounted on the cup with connection through a check valve to a rubber bulb. The valve seat is tested before the engine is assembled, when the cup is applied and held tightly to the surface of the cylinder head. Ten pounds air pressure is given to the cup by squeezing the bulb two or three times, the slightest leakage of air past the valve resulting in a drop of pressure as read on the gage.—Black & Decker Manufacturing Co., Towson, Maryland.

Swimming Bladders

Tom and Tini, the jolly twins, are designed for the use of the beginner in aquatic sports, and will easily support the weight of the average adult. To inflate, remove the galalith stopper, fill the bag with air, put stopper into tube and tuck tube into the ball. The two balls are joined together with a cotton strap which may be removed and the balls separated and used for other sports. The twins are made of



Tom and Tini

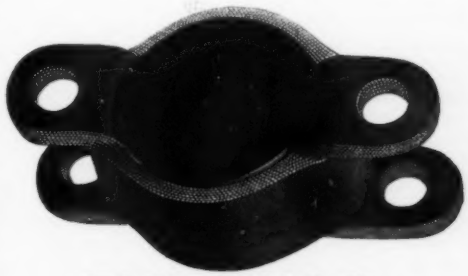
the best quality rubber and durably hand painted. — Harburger Gummiwarenfabrik Phoenix A. G., Harburg a/Elbe, Germany.

Potters' Rubbers

These egg shaped rubbers are used by potters when working clay. They are made from elliptical pieces of rubber, with beveled edge, and vary in size from three to six inches in length and from one and a half to two and a half inches in width. The use of these rubbers is not so universal as formerly because of the new method of casting that has taken the place, in the majority of factories, of the old method of working clay.

Universal Flexible Shackles

Greater riding comfort and silence is obtained by the use of rubber mountings in car construction, and with this new universal flexible shackle old, as well as new, cars can be equipped without changing car design. This all rubber and fabric design shackle is to replace the metal shackle and will eliminate all oil or greasing of hinge joints, wearing out of shackle bolts and bushings, and overcome at least about seventy-five per cent of the chatter and noises of a car. The outer casings and lugs are woven of heavy belting stock, being built up equal to six-ply rubber belting, and encompassing a resilient rubber core. By the use of metal bushings in the eyes of the shackle, the regular shackle bolt and alemite cup is dispensed with, and an ordinary bolt drawn up tight makes a noiseless assembly; while the shackle can flex freely on the bushings to accommodate the shortening and lengthening of the springs in meeting uneven road conditions. The shackle is manufactured by the W. F. Gammeter Co., Cadiz, Ohio.



All Rubber and Fabric Shackle

Editor's Book Table

"Le Caoutchouc Durci." By A. D. Luttringer, editor-in-chief of "Le Caoutchouc et la Gutta Percha." Published by A. D. Gillard, editor of Encyclopédie du Caoutchouc et des Matières Plastiques. Paper, 198 pages, 6 by 9 inches.

IN the twenty chapters of this volume the author has made an interesting and valuable contribution to the study of hard rubber by collecting material which heretofore had been scattered and available only in special periodicals. He has divided his subject under such headings as: the properties and chemical analysis of hard rubber; mechanical and electrical tests; manufacture of rods and tubes, molded goods, vessels and linings; manufacture of articles of compressed powder; substitutes for hard rubber; semi-hard rubber; dental rubber; the future of hard rubber, etc. An important bibliography is included.

"Fortschritte in der Kautschuk-Technologie." By Dr. F. Kirchhof. Volume XIII of the series Technische Fortschrittsherichte, edited by Professor Dr. B. Rassow. Leipzig. Published by Theodor Steinkopff, Dresden and Leipzig. Paper, 213 pages, 6 by 8¾ inches. Two indices, illustrations, tables.

The little book is primarily intended for rubber technicians and chemists who have little time or opportunity to follow closely the newest scientific and patent literature, either German or foreign. The author, whose many writings on rubber have made him well-known in his present work, treats only the really new and most promising developments in the rubber industry during the last decade, to about the middle of 1926.

The opening pages give a brief review of the production and consumption of rubber, restriction, native rubber, falling off of African rubber and American plantations, the rest of the work being devoted to technological subjects. This part is divided into twelve chapters and treats of tapping methods, rubber latex, modern methods of preparing rubber, working crude rubber, compounding ingredients, rubber solvents and solutions, vulcanization, accelerators; rubber regeneration and reclaims, synthetic rubber, hydrorubber, cyclo-rubber, super-polymers, recent applications and possibilities of using crude rubber and reclaims, mechanical and technological testing of rubber. The value of the work is enhanced by numerous references, both German and foreign, several clearly printed illustrations of different types of rubber machinery and an index of names of firms and individual besides a general index.

"Production of Gutta Percha, Balata, Chicle and Allied Gums." By Joseph Vander Laan. Trade promotion series No. 41, Bureau of Foreign and Domestic Commerce, United States Department of Commerce. Paper, 72 pages, 5¾ by 9 inches.

An excellent compendium and the most complete ever issued by the Federal Government covering the materials named, and prepared under the direction of H. N. Whitford, chief, crude rubber section, Rubber Division, as part of the survey of essential raw materials authorized by the 67th Congress. It is the seventh of a series of publications dealing with crude rubber and kindred materials wholly or largely under foreign control.

The report treats not only of true gutta percha, with balata and chicle, but also of jelutong or pontianak and the various inferior guttas, the imports of all in 1925 being valued at $8,833,000. It abounds in interesting data concerning the varieties, collection, preparation, and sources of the many rubber-like gums, tells of their numerous applications, gives the history of their production in the British and Dutch East Indies, British Malaya, and South and Central America, and supplies statistics of their export and the amounts consumed by various countries for many years. Of especial interest is the information concerning efforts made to cultivate gutta percha trees and points out the need also of chicle plantations to offset a possible diminution of the wild crop. An extended bibliography is also a good feature.

"Le Livre d'Or de l'Industrie du Caoutchouc." Published by the *Revue Générale du Caoutchouc*, 18 Rue Duphot, Paris, on the occasion of the Seventh International Rubber Exposition, Paris. Heavy paper, 320 pages, 8¾ by 11 inches. Illustrated.

A number of timely articles, some by internationally-known rubber men, has been gathered together in this volume which is printed on heavy art paper and appropriately illustrated, resulting in a work that is at once instructive and attractive.

The contents fall into six sections, the first comprising preface, introduction and an article on "Welfare Work," by E. Michelin. The second part covers the world's rubber industry and includes two articles on the French industry by O. Homberg and W. Hausser respectively, while F. Jones, A. A. Somerville, O. Englebert, A. Pirelli, W. Lindemann, discuss the industry in their respective countries, namely England, America, Belgium, Italy and Germany. The third part is devoted to the chief rubber manufactures—tires, surgical goods, hard rubber, rubberized fabrics and waterproof garments, each of these items being handled by well-known French rubber men. Crude rubber, gutta percha and balata are discussed in the fourth section where space has also been given to a paper on the Stevenson Scheme by C. Baxendale. Rubber Technology is covered in the fifth part by articles on The Structure of Rubber Studied by Means of X-Rays (R. Fric), Mixings and Raw Materials (C. Gazel), Rubber Tires (J. Audy), Regeneration of Rubber (F. Boiry), Hard Rubber Fittings (J. Panem), and Ruber-Insulated Cables (C. Iung).

The final section includes a list of advertisers, list of members of the Syndicat du Caoutchouc (Rubber Association) and members of the Syndicat des Fabricants de Fils et Cables Electriques (Association of Manufacturers of Electrical Wires and Cables). An interesting feature of the last two lists is the frequent inclusion of trade mark words and reproductions of trade marks.

"The Construction of Smokehouses for Small Rubber Estates." By T. E. H. O'Brien, chemist, Rubber Research Scheme (Ceylon). Published by H. Ross Cottle, Government Printer, Colombo, Ceylon. Paper, 11 pages, illustrated, 5½ by 8½ inches.

This pamphlet summarizes the results of an investigation made during the last few years as to the best methods of preparing smoked sheet rubber. Mr. O'Brien's notes on the construction of smokehouses have been made with the interests of the small plantation owner in mind.

"The Interrelationship of Yield and the Various Vegetative Characters in Hevea Brasiliensis." By R. A. Taylor, physiological botanist, Rubber Research Scheme (Ceylon). Published by H. Ross Cottle, Government Printer, Colombo, Ceylon. Paper, 65 pages, 5½ by 8½ inches.

Experiments have been made with 161 Hevea trees, as grown at the Department of Agriculture Experiment Station at Peradeniya, and the results of these investigations are embodied in the present pamphlet. The paper represents a continuation of a former bulletin, prepared by Messrs. Bryce and Gadd, and entitled "Yield and Growth in *Hevea Brasiliensis*."

"Benjamin Garver Lamme, Electrical Engineer—An Autobiography." Published by G. P. Putnam's Sons, New York, N. Y. Cloth, illustrated, 6 by 9 inches.

This autobiography is of especial value, as it places on record the life-long activities of a man who was not only one of the leaders in the ranks of the Westinghouse Electric & Manufacturing Co., but of the electrical industry throughout the world. Mr. Lamme wrote in a clear and concise style, while, as his editor states, "his manner of expression was part of his personality and shares in his charm." The book will be welcomed by scientists everywhere.

Abstracts of Recent Articles

DATA ON SPECIFIC GRAVITIES OF CHEMICALS AND MATERIALS USED IN RUBBER COMPOUNDING OR OF GENERAL INTEREST IN CONNECTION THEREWITH.—*I. R. J.*, Mar. 12, 1927, p. 430; Mar. 19, 1927, p. 468.

BALATA BELTING, NOTES ON ITS MANUFACTURE.—Anon. *I. R. J.*, Mar. 12, 1927, pp. 437-41.

RUBBER AS A CONSTRUCTIONAL MATERIAL IN CHEMICAL ENGINEERING.—B. D. Porritt, *I. R. J.*, Mar. 12, 1927, pp. 442-446. Graphs.

ELECTRICAL PROPERTIES OF RUBBER SULPHUR COMPOUNDS.—*Bu. of Stds. Bull.* 119. Mar., 1927.

MECHANICS OF FRONT WHEEL SHIMMY. Gyroscopic theory in explanation of how shimmy starts and why it continues.—H. A. Huebotter, *J. Soc. Auto. Engrs.*, Apr., 1927, pp. 423-425.

THE ELECTRODEPOSITION OF RUBBER.—S. E. Sheppard, *J. Soc. Auto. Engrs.*, Apr., 1927, pp. 514-18.

COMMERCIAL POSSIBILITIES OF RUBBER ELECTRODEPOSITION PROCESS.—J. W. Schade, *J. Soc. Auto. Engrs.*, Apr., 1927, pp. 521-525.

THE MOTOR TRUCK TIRE IN ITS RELATIONS TO THE VEHICLE AND TO THE ROAD.—J. A. Buchanan, *J. Soc. Auto. Engrs.*, Apr., 1927, pp. 469-477.

THE RUBBER CONTENT OF AMMONIATED LATEX.—R. O. Bishop. *Malayan Agri. J.*, Jan., 1927, pp. 1-11. Tables and graphs.

BUD GRAFTING OF RUBBER TREES.—F. G. Spring, *Malayan Agri. J.*, Jan., 1927, pp. 21-23. Tables.

RUBBER SOFTENERS AND THEIR INFLUENCE ON AGING.—W. N. Burbridge, *Trans. Inst. Rubber Ind.*, 1926, pp. 256-266.

THE OBSERVATION OF CATAPHORESIS IN COLORLESS SOLS. I. THE CHARGE ON RUBBER IN BENZENE.—R. H. Humphry and R. S. Jane, *Trans. Faraday Soc.*, Oct., 1926.

UTILIZATION OF PLASTIC WASTES. Description of the processes of treating waste soft and hardened rubbers, celluloid, casein products, synthetic resins and mother of pearl.—Albert Hutin, *Rev. Gén. Mat. Plastiques*, 482-6, 1925.

STRIPE CANKER EXPERIMENTS. Report for November, 1926.—Herbert Ashplant, A. R. C. S. *Planters' Chronicle*, January 29, 1927, pp. 57-62. Table.

INVESTIGATIONS IN CONNECTION WITH BALL RUBBER (RUBBER PREPARED ACCORDING TO THE BRAZILIAN METHOD).—O. de Vries and W. Spoon, *Archief*, Jan., 1927, pp. 1-44; English version, pp. 45-65. Illustrations, tables.

New Trade Publications

"DRAFTS IN FOREIGN TRADE" IS THE TITLE OF A BOOKLET OF thirty-nine pages, written by L. O. Bergh, associated with the American Manufacturers Foreign Credit Underwriters, Inc., 381 Fourth avenue, New York, N. Y. The pamphlet represents a summary of the legal requirements in foreign countries relating to the protest, form and endorsement of drafts.

"'BUFFALO' RUBBER-COVERED FANS FOR CHEMICAL SERVICE" IS the title of an illustrated bulletin published by the Buffalo Forge Co., Buffalo, New York. The fans described in the publication are lined with "Vulcalock," as processed by The B. F. Goodrich Co., Akron, Ohio.

THE OAK RUBBER CO., RAVENNA, OHIO, SPECIALIZING IN THE production of toy balloons, is sending out a new catalog, illustrated in color, and entitled "Oak Brand Balloons."

THE BOSTON WOVEN HOSE & RUBBER CO., CAMBRIDGE, MASSAchusetts, is sending out its illustrated and revised catalog of mechanical rubber goods, this representing a hardware and mill supply edition.

"DOING EXPORT BUSINESS" IS THE TITLE OF A COMPREHENSIVE pamphlet of 63 pages, prepared by the Foreign Commerce Department of the Chamber of Commerce of the United States, Washington, D. C.

"THE HYDRAULIC PRESS" IS THE TITLE OF THE ILLUSTRATED house organ now being published by the Hydraulic Press Manufacturing Co., 20 East Broad street, Columbus, Ohio.

THE GATES RUBBER CO., DENVER, COLORADO, IS PUBLISHING, IN the interests of its accessories division, a semi-monthly house organ entitled "Gates Vulco News."

TIRE INVENTORY — PRODUCTION — DOMESTIC SHIPMENTS

The favorable advance begun last December in both shipments and production of balloon casings and balloon inner tubes has continued into the new year, the January figures being 1,793,778 and 1,794,623 for production and shipments of these casings, as against 1,502,724 and 1,537,085 for the month previous. The corresponding January estimates for inner tubes are 1,840,966 and 1,965,152, while the December totals were respectively 1,440,646 and 1,628,872. There is also a favorable decline in inventory continuing for both classes of goods.

High pressure cord casings cannot, however, show quite such encouraging records, there being considerable declines in January production and shipments, while the inventory has meanwhile been growing somewhat larger as compared with the month previous. Shipments of high pressure inner tubes were, however, larger in January than in December, with a corresponding lessening of the inventory figure, the same condition prevailing in the totals for solid and cushion tires.

	January, 1927		
	Inventory*	Production	Total Shipments
Pneumatic casings—all types	7,824,045	3,723,890	3,699,122
Inner tubes—all types	11,688,871	4,002,566	4,512,273
Balloon casings	3,119,263	1,793,778	1,794,623
Balloon inner tubes	3,977,723	1,840,966	1,965,152
High pressure cord casings	4,067,010	1,785,904	1,744,469
High pressure inner tubes	7,711,148	2,161,600	2,547,121
Solid and cushion tires	163,635	42,693	41,080

COTTON AND CRUDE RUBBER CONSUMPTION IN TIRES AND TUBES

	Pounds
Cotton fabric	14,358,414
Crude rubber	44,078,473

*As of January 31, 1927.

The February production of all types of casings totaled 3,821,978 against an output of 3,723,890 in January and 3,648,972 in February of last year. This gain of 2½ per cent was caused by the increase in production of balloon tires, while the figures for high pressure casings showed a decline of approximately 5 per cent and those for fabric casings a falling-off of about 25 per cent.

There was a decrease also in the amount of cotton fabric used by the tire industry in February as compared with the January total, the figures being 13,609,241 and 14,358,414 pounds respectively. The consumption of crude rubber however represented an advance, the February figure being 45,036,863 pounds, as compared with the January total of 44,078,473.

	February, 1927		
	Inventory*	Production	Total Shipments
Pneumatic casings—all types	8,281,317	3,821,978	3,344,071
Inner tubes—all types	12,056,747	4,244,233	3,840,194
Balloon casings	3,244,752	2,017,711	1,886,975
Balloon inner tubes	4,200,796	2,251,634	2,012,852
High pressure cord casings	4,376,726	1,696,973	1,377,080
High pressure inner tubes	7,855,951	1,992,539	1,827,342
Solid and cushion tires	161,124	43,767	45,889

COTTON AND CRUDE RUBBER CONSUMPTION IN TIRES AND TUBES.

	Pounds
Cotton fabric	13,609,241
Crude rubber	45,036,863

*As of February 28, 1927.
Rubber Association figures representing 75 per cent of the industry.

UNITED STATES EXPORTS TO BELGIUM OF RUBBER PACKING INCLUDE for the last three years the following: (1924) 9,653 pounds, value $4,538; (1925) 43,588 pounds, value $13,669; (1926) 18,815 pounds, value $10,393. Most of the rubber packing imported into Belgium comes from England and France.

Rubber in Animated Animals and Figures

A VISITOR to New York City, a year or so ago, passing along the so-called "cross roads of the world" in Times Square, would have stopped in front of the Astor Theater to gaze in wonder at a most realistic, animated dinosaur. This prehistoric reptile was in miniature, measuring eight feet long. Its movements were so real as to force attention and admiration. The beast arched and swayed its long neck, opened its mouth and flopped its tongue, at the same time heaving its sides for breathing, and swinging its long powerful tail somewhat impatiently. The animation was perfect in all its complicated movements. Over in Newark, New Jersey, in a well-known department store, a little later in the year you could see this same monster, but in life-like proportions, as shown in Figure 1. There they showed the dinosaur, 47 feet long and 9½ feet high and able to raise its menacing head and its powerful tail 15 feet above the floor. During the Christmas holidays more than 400,000 persons were taken up in the stores' elevators to view this monster dinosaur which roamed the earth millions of years ago.

Fig. 1—Dinosaur Brontosaurus Made Life-like by Use of Rubber.

Toy making as an industry has made remarkable progress in this country. But it is safe to say that nowhere else in the world today is it possible to find an organization so uniquely American in origin, development and in its manufactured products as this one which produces dinosaurs, mastodons and any other of the monsters from prehistoric ages down to the domesticated and wild jungle and forest animals of our own time.

To the man interested in rubber it is pleasing to learn that rubber is indispensable in the construction of these modern reproductions of prehistoric animals. The wonderful play of muscle, tendon, ligament, and joint which makes movement so graceful in all living creatures is admirably imitated in these monster toys by a clever use of rubber, gears and motors. It is difficult to conceive what could really take the place of rubber in these structures. Whoever saw the film, "The Lost World" in which animated monsters were used, can appreciate how essential the properties of rubber are in producing the illusion of life. Wherever life movements have to be reproduced as for instance in the motions of the neck, of the legs and arms, of the tail, in the opening of the jaws, the raising of the eye lids and so on, there rubber in some form has to be used. And the life-like motion that is produced is truly marvelous.

The world has to applaud the persevering energy and pluck of the pioneers in this field, Messmore & Damon of New York City, who have developed an art which is bringing them into national recognition. They have a constant demand for all sorts of animated sculptures to be used for display and educational purposes. Better than any museum of natural history where mere skeletons are shown is their collection of these colossal prehistoric reptiles of long ago, because by means of their art they bring these monsters to life for you in a weirdly fascinating way.

In Figure 2, the body of the cow is made of papier maché. First an artist models the cow in clay. Molds are then made from this with plaster of paris. Then 15 or more wet strips of "bogus" paper are deftly laid in the molds. After thoroughly drying in ovens, the papier maché "casts" are put together. If exposure to the elements is required of the animal it is painted with a rubber solution. Then those portions of the animal which are to display motion are specially rubberized. In the case of the cow illustrated, the neck, eyes, mouth and tail move. The photo shows how the neck is developed. Strips of rubber are applied across the papier maché strips forming the neck. As the motor and gears give a swaying motion to the neck the rubber strips will permit a movement perfectly simulating that of a real cow's neck. And so in other animals.

Here is one more instance of an important use of rubber in modern industry and craftsmanship. There never can be too much crude rubber grown, for new uses are found every day for this remarkable raw material.

Fig. 2—Animated Cows Constructed with Papier Maché and Rubber.

UNIQUE AIRLESS TIRE[1]

This is a resilient tire of German invention intended for automotive vehicles. It presents unique structural features which render it easy riding and give it a road mileage estimated at 75,000 miles. It comprises a circular series of sectors of light gravity metal in box-like and thin-walled form. These cellular sectors are separated and interlocked with laminations of rubber and when the tire revolves the air circulates through the interior and conducts away the heat. The assembled tire resembles a circular arch in its construction and is mounted on a special disk wheel by means of link joints which admit radial movement of the cellular tire sections thus affording resiliency in action. The tire carries an anti-skid rubber tread and is said to have already made a road record of 37,500 miles.

[1] *Gummi Zeitung*, Feb. 11, 1927, p. 1111.

American Mechanical Rubber Goods Exports

Philip M. Crawford

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THE general trend of mechanical rubber goods exports for the past three years has been upward; in 1924 they were valued at $4,656,221, in 1925 at $5,403,318, and in 1926 at $6,629,283. According to *Commerce Reports*, every item of the mechanical class gained steadily in both volume and value,—the value gains, however, were more pronounced than the volume gains because of the increase of unit values, which, although practically dormant during 1924 and 1925, showed pronounced activity during 1926.

Table 1 shows the position of exports of the mechanical class in 1925 and 1926.

TABLE 1

MECHANICAL GOODS EXPORTS

Item	1925 Quantity	1925 Value	1925 Unit Value	1926 Quantity	1926 Value	1926 Unit Value
Belting .....pounds	4,078,651	$2,424,661	$0.60	4,175,810	$2,657,036	$0.63
Hose .....pounds	5,348,859	2,097,951	.39	6,124,960	2,523,402	.41
Packing .....pounds	1,914,962	880,706	.46	2,149,337	1,096,985	.51
Rubber and friction tape .....pounds	(1)	(1)	....	1,087,447	351,860	.32
Total.....	.....	$5,403,318	....	.....	$6,629,283	....

[1]Not reported separately in 1925.

Exports of Rubber Belting

Exports of rubber belting, the most important value item of the mechanical class, totaled in 1926 more than 4,000,000 pounds, valued at over $2,500,000. Record shipments of the year were made in December, 515,167 pounds valued at $284,484. The volume trend during the year was erratic, the peaks coming in March, September and December, and the lows coming in August and January. The average was slightly less than 350,000 pounds a month, and only two months, June and November, in addition to those mentioned above, passed this average.

In 1925 the trend was also irregular. Peak shipments were made in July and August, July being high for the year with exports of 460,079 pounds. The average was about 340,000 pounds a month, and March, April, May, and September exports exceeded this mark. Lows for the year came in February and November.

Unit Values

During the first six months of 1926 the unit value trend was generally upward, although the January figure of $0.69 was followed by a drop to $0.64 in February, after which the increase was constant, culminating in the May figure of $0.72. The June figure declined again to $0.62. For the second six month period two distinct movements and two minor movements were noted—from July to September downward, and from September to November upward; from June to July upward, and from November to December downward.

The high unit value for the year was $0.72 in May, and the low was $0.55 in December, concurrent with the record exports of the year.

Chile's Imports of Rubber Belting

Chile, the most important purchaser of rubber belting in 1926, bought 584,052 pounds, valued at $308,100. The next two markets were also on the American Continent, Mexico and Canada. British South Africa, the United Kingdom, and Australia follow, with Belgium in seventh place, and the Philippine Islands eighth with more than 150,000 pounds. In 1925 eight markets also bought more than 150,000 pounds each, led by Mexico, and including all the tabulated group except the last two. In their stead were Brazil in sixth position, and Argentina in eighth.

Table 2 shows the principal markets for rubber belting.

TABLE 2

RUBBER BELTING EXPORTS

Destination	Pounds	Value	Unit Value	Per Cent of Total by— Volume	Value
Total shipments	4,175,810	$2,657,036	$0.63	100.0	100.0
Chile	584,052	$308,100	$0.53	14.0	11.6
Mexico	386,296	265,068	.69	9.3	10.0
Canada	359,533	222,758	.62	8.6	8.4
British South Africa.....	355,157	204,350	.58	8.5	7.7
United Kingdom	270,609	197,182	.73	6.5	7.4
Australia	265,295	145,705	.55	6.4	5.5
Belgium	168,343	87,799	.52	4.0	3.3
Philippine Islands	153,638	99,502	.65	3.7	3.8

Regional Market for Rubber Belting

The American Continents lead, as in the case of automobile casings and canvas rubber-soled shoes, as market for rubber belting. South America, the leading regional destination, took more than 25 per cent of the American exports of rubber belting; more than half the shipments went to Chile. Other important South American markets were Brazil, Argentina, and Peru.

The major share of exports to the Caribbean region was taken by Mexico, although Cuba is also a fairly important market. Canada took practically the whole of shipments to the North American Continent.

Europe, the next most important region, had fairly large shipments to the northern and central countries and to the British Isles. Exports to the northern group were dominated by Sweden, Finland, and Soviet Russia in Europe. Belgium was the outstanding central European market, with France of secondary importance. The United Kingdom took practically all of the exports to the British Isles.

For the first time in any of these surveys Africa is important, owing largely to the large volume of exports of rubber belting to British South Africa, our fourth best customer.

Asia follows Africa in importance. The Philippine Islands was the only market buying over 150,000 pounds, but British India, China, and Japan all took substantial quantities.

Australia dominates shipments to Oceania, which imports least of all the world regions.

Table 3 shows the position of the world regions as purchasers of rubber belting.

TABLE 3

RUBBER BELTING EXPORTS BY CONTINENTS IN 1926

Destination	Pounds	Value	Unit Value	Per Cent of Total by— Volume	Value
Total shipments	4,175,810	$2,657,036	$0.63	100.0	100.0
Europe (total)	829,406	$546,405	$0.66	19.9	20.6
Northern Europe	228,605	154,007	.67	....	....
Central Europe	301,486	177,407	.59	....	....
Southern Europe	28,651	17,767	.62	....	....
British Isles	270,664	197,224	.73	....	....
Americas (total)	1,995,731	1,294,352	.65	47.8	48.7
North America	376,705	238,649	.63	....	....
Caribbean region.....	526,702	372,125	.71	....	....
South America	1,092,324	683,578	.63	....	....
Asia (total)	514,460	334,800	.65	12.3	12.6
Oceania (total)	281,944	155,089	.55	6.8	5.8
Africa (total)	554,269	326,390	.59	13.2	12.3

Rubber Hose Exports Gain in 1926

Exports of rubber hose have shown the largest and most consistent percentage of volume gain of any of the items of the mechanical rubber goods class. The 1925 exports exceeded 1924 by about 20 per cent, and 1926 in turn gained about 15 per cent over 1925. The 1926 exports of rubber hose totaled 6,124,960 pounds, valued at $2,523,402. The unit value was $0.41 a pound, an increase of $0.02 a pound from the $0.39 figure for both 1925 and 1924.

Record shipments of rubber hose were made in April—674,344 pounds; other months reporting large shipments were March, July, December, and June, in order. The average for the year was slightly more than 510,000 pounds a month, and each of the abovementioned months exceeded this figure. The lows for the year were in October and August.

The volume trend of exports was upward during the first six months, April and March peaks being outstanding. During the last six months the first three were generally downward and the last three upward.

The unit value trend during the first six months of 1926 was generally upward—from February through May the figures gained 1 cent each month, starting at $0.40 and culminating with $0.43 for May, peak for 1926. Both February and June declined from the preceding month. During the second six months the unit values fluctuated from month to month, the increase or decrease in all except one instance being 1 cent. The December unit value of $0.39 was low for the year.

Important Markets

In 1926, nine markets each bought more than 200,000 pounds of rubber hose from the United States. The United Kingdom was the most important of this group, taking 977,157 pounds, valued at $343,608, about 16 per cent by volume and almost 14 per cent by value of our total exports. Among the other important markets, one was in Oceania, five in the American Continents, one in Africa, and one in Asia.

Table 4 details our exports of rubber hose to the principal markets.

TABLE 4

PRINCIPAL MARKETS FOR RUBBER HOSE IN 1926

Destination	Pounds	Value	Unit Value	Per Cent of Total by— Volume	Value
Total shipments	6,124,960	$2,523,402	$0.41	100.0	100.0
United Kingdom	977,157	$343,608	$0.35	16.0	13.6
Australia	579,924	192,457	.33	9.5	7.6
Mexico	558,416	260,294	.47	9.1	10.3
British South Africa	486,057	213,847	.44	7.9	8.5
Japan	365,783	120,785	.33	6.0	4.8
Canada	351,244	149,272	.43	5.7	5.9
Cuba	285,568	114,881	.40	4.7	4.6
Chile	283,440	129,670	.46	4.6	5.1
Argentina	210,867	82,476	.39	3.4	3.3

Regional Hose Market

The American Continents took the largest share of rubber hose exported by the United States—2,631,287 pounds, valued at $1,202,816, more than 40 per cent by volume and almost 50 per cent by value. The Caribbean region, with Mexico and Cuba as its outstanding markets, was the leading section. Chile and Argentina were the leading markets of South America, although Venezuela, Brazil, Peru, and Colombia each took a considerable portion. Canada bought practically all the hose shipped to North America.

Europe, the second region of importance, took 1,579,438 pounds, valued at $599,497, of which more than half was taken by the British Isles. Central Europe, with Netherlands and Belgium as outstanding markets, was the next European region of importance.

Japan was the only market in Asia buying more than 200,000 pounds, but with the Philippine Islands and British India as secondary markets this continent ranked third among the regions of the world.

Oceania's share was about 10 per cent by volume and almost 9 per cent by value. Australia took almost 90 per cent of the volume of exports to this region. British South Africa, with purchases of about 485,000 pounds, took more than 90 per cent of all our shipments of hose to Africa.

Table 5 summarizes the position of the important regions as rubber hose markets of the United States.

TABLE 5

HOSE EXPORTS BY CONTINENTS IN 1926

Destination	Pounds	Value	Unit Value	Per Cent of Total by— Volume	Value
Total shipments	6,124,960	$2,523,402	$0.41	100.0	100.0
Europe (total)	1,579,438	$599,497	$0.38	25.8	23.8
Northern Europe	148,684	62,764	.42	....	....
Central Europe	397,820	167,085	.42	....	....
Southern Europe	54,463	25,645	.47	....	....
British Isles	978,471	344,003	.35	....	....
Americas (total)	2,631,287	1,202,816	.46	42.9	47.7
North America	373,323	159,903	.43	....	....
Caribbean region	1,201,892	558,544	.47	....	....
South America	1,056,072	484,369	.46	....	....
Asia (total)	762,946	278,784	.37	12.5	11.0
Oceania (total)	648,851	219,763	.34	10.6	8.7
Africa (total)	502,438	222,542	.44	8.2	8.8

Packing Exports

Rubber packing exports in 1926 totaled 2,149,337 pounds, valued at $1,096,985, an increase of about 12 per cent in volume and 25 per cent in value over 1925. The unit value of shipments increased from that of $0.46 a pound in 1925 to $0.51 in 1926.

Record shipments for the year of 261,078 pounds were made in December; March was the only other month to pass the 200,000-pound mark. The low shipments were in January and September, each slightly below 150,000 pounds. The average monthly exports were almost 180,000 pounds.

The unit value trend during 1926 constantly fluctuated, though within fairly narrow bounds. The lowest unit value of the year of $0.48 came in September, with the peak of $0.55 in March. The average unit value of the first half year was $0.52 and of the second half $0.50.

Leading Rubber Packing Markets

Three of the markets taking more than 100,000 pounds of rubber packing were on the American Continents. Canada bought almost 20 per cent of our total exports of this item; Mexico, Cuba, and Chile were the other important markets. Three other regions took more than 100,000 pounds—Japan in Asia, United Kingdom in Europe, and Australia in Oceania.

Table 6 details the markets taking more than 100,000 pounds.

TABLE 6

PRINCIPAL PACKING MARKETS IN 1926

Destination	Pounds	Value	Unit Value	Per Cent of Total by— Volume	Value
Total shipments	2,149,337	$1,096,985	$0.51	100.0	100.0
Canada	372,312	$171,753	$0.46	17.3	15.7
Japan	230,615	117,213	.51	10.7	10.7
Mexico	211,363	105,288	.50	9.8	9.6
United Kingdom	210,448	121,927	.58	9.8	11.1
Cuba	158,726	76,346	.48	7.4	7.0
Australia	103,814	50,137	.48	4.8	4.6
Chile	100,744	45,787	.46	4.7	4.2

Rubber and Friction Tape Shipments

Rubber and friction tape, which was separately brought out in the rubber classification of 1926, totaled 1,087,447 pounds valued at $351,860. The average unit value was $0.31 a pound for the year; the general trend of the unit has been downward although a staggered tendency was also noticeable. The peak of the year was $0.37 a pound in January and the low $0.28 in December.

The exports of rubber and friction tape during each of the first four months increased, then declined in May, and increased again in June. The peaks for the first six months were in April, 111,313 pounds, and June, 104,351 pounds. During the second half of 1926 exports have been heavy one month and light the next month. July exports of 117,019 pounds set the record; September's 112,666 pounds and November's 112,931 pounds were the other peaks. January, with exports of 42,438 pounds, was low for the year.

Financial and Corporate News

California Goodyear Dividend

GOODYEAR TIRE & RUBBER CO. OF CALIFORNIA, at its annual stockholders' meeting in April announced that dividends were being declared on the common stock, all owned by the parent company in Akron. Two instalments were disbursed during 1926 at the rate of 30 per cent, and the first paid on the common stock since the California company was organized in 1919. A subsidiary, the Goodyear Textile Mills, in Los Angeles, also began the payment of dividends on its common stock at the rate of $5.25 a share. Its 1926 net profits were $237,505; and for 1925, $230,817.

The tire and rubber company's net profits for 1926 amounted to $1,973,305.62, equal to $24.82 on the 79,957 outstanding preferred shares, and comparing with $3,686,578 or $46.11 a share for 1925, the decrease being due mainly to liquidation of high-priced stocks on a declining market, a condition not likely to be soon duplicated, and one which troubled nearly all rubber manufacturers. The surplus for 1926 was $3,785,796.94, and that of 1925 was $4,691,588.32; 1926 sales were $25,870,041, and for 1925 $24,363,238. Cash, including call loans, December 31, 1926, was $5,064,756, since reduced by the purchase for about $1,300,000 of all the common shares of the Goodyear Textile Mills and for products shipped in anticipation of spring business. Current assets to liabilities rate as 6.61 to 1, the assets totaling $14,191,877.68.

United States Rubber Plantations, Inc.

The rubber plantations owned by the United States Rubber Co. comprise a total area of 134,164 acres, of which 104,232 acres are located in Sumatra and 29,932 acres in Malaya. Of the total area, 82,574 acres have been planted and about 18,000 acres are in the course of development. Of the present planted areas, 51,828 acres are in bearing and the remainder of 30,646 acres will come into bearing progressively during the next five years. Production amounted to 22,900,000 pounds for the year 1926, an increase of 3,230,000 pounds as compared with 1925.

These properties represent a total investment of $29,662,000. Of this amount, $18,000,000 was invested by the United States Rubber Co., and the remainder, amounting to $11,662,000, was provided from earnings of the plantations companies.

The net profits of the plantations, according to cabled advices, amounted to approximately $6,000,000 for the year 1926, after providing adequate reserves for depreciation of plant and equipment and amortization of the cost of development, and for foreign income taxes. A dividend amounting to $6,000,000, representing these profits, was declared, and paid to the United States Rubber Co. as of December 31, 1926.

Rubber received from the plantations is taken into account by the United States Rubber Co., at current market prices, and the plantation companies are credited in open account. The plantations companies draw against this open account for current cash requirements, and the balance not required for operating and development purposes is retained by the United States Rubber Co., and is comprised in its general assets. The balance of the open account amounted to $4,310,105.26 as of December 31, 1926, after the above-mentioned dividend of $6,000,000, had been paid to the United States Rubber Co.

The consolidated general balance sheet of United States Rubber Plantations, Inc., according to cable advices, indicates that the unappropriated surplus, after payment of the dividend of $6,000,000, amounted to $8,879,241 as of December 31, 1926, no part of which was included in the surplus account of the United States Rubber Co.

CONSOLIDATED GENERAL BALANCE SHEET—DECEMBER, 31, 1926

(according to cabled advices)

Assets		
Cash	$370,834.37	
Accounts receivable	185,996.93	
Inventories of crude rubber in preparation for shipment, and other materials and supplies	2,764,097.94	
Total current assets		$3,320,929.24
Open account with United States Rubber Co.		4,310,105.26
Land, development of properties, and equipment		29,662,966.53
Prepaid and deferred assets		381,107.14
Total assets		$37,675,108.17
Liabilities, Reserves and Capital		
Accounts payable	$1,248,031.62	
Total current liabilities		$1,248,031.62
Reserves for insurance	$74,973.70	
Reserves for share of profits to staff and leave expenses	1,079,661.72	
Reserves for Dutch East Indies income tax	915,764.09	
Total reserves		2,070,399.51
Investment of United States Rubber Co., represented by the entire capital stock of U. S. Rubber Plantations, Inc.		18,000,000.00
Appropriated surplus: reserves for amortization of properties and for depreciation of equipment	$7,477,435.88	
Surplus	$14,879,241.16	
Less dividend paid as of December 31, 1926	6,000,000.00	8,879,241.16
Total surplus		16,356,677.04
Total liabilities, reserves and capital		$37,675,108.17

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Akron Rubber Reclaiming Co.	Pfd.	2% q.	Apr. 1	Mar. 20
Dominion Rubber Co.	Pfd.	1¾% q.	Mar. 31	Mar. 28
Fisk Rubber Co.	1st pfd. conv.	1¾% q.	May 2	Apr. 15
Fisk Rubber Co.	1st pfd.	1¾% q.	May 2	Apr. 15
Fisk Rubber Co.	2nd pfd.	1¾% q.	June 1	May 16
Goodrich, B. F., Co.	Com.	$1.00	June 1	May 16
Goodyear Tire & Rubber Co. of Canada	Pfd. (arrears)	1¾% q.	Apr. 15	Mar. 31
Manufactured Rubber Goods Co.	Pfd.	1½% q.	Apr. 11	Mar. 31
Overman Cushion Tire Co., Inc.	Com.	1½% q.	Apr. 1	Mar. 25
Overman Cushion Tire Co., Inc.	Pfd.	$1.75 q.	July 1	.....
Stedman Products Co.	Pfd.	$1.75 q.	Apr. 1	Mar. 25
United States Rubber Co.	1st pfd.	2% q.	May 14	Apr. 20

Akron Rubber Stock Quotations

Quotations of April 20, supplied by Otis & Co., Cleveland, Ohio.

Company	Last Sale	Bid	Asked
Aetna com.	18	17	19½
Aetna pfd.	95	..	..
Falls com.	4⅞	1	4
Falls pfd.	8	..	12
Faultless com.	39	37¼	38½
Firestone com.	123	120	125
Firestone 1st pfd.	105½	105½	106
Firestone 2nd pfd.	101½	102	..
General com.	150	..	150
General pfd.	102½	..	110½
Goodrich pfd.	100	..	..
Goodyear com. V. T. C.	45½	45	49¾
Goodyear pfd. V. T. C.	110	..	..
Goodyear pr. pfd. V. T. C.	109	..	..
India com.	26¾	..	27
Miller com.	35	..	..
Miller pfd.	102¾	102	102½
Mohawk com.	15	..	16
Mohawk pfd.	45	40	45
Seiberling com.	23	23¼	24
Seiberling pfd.	99	99	100
Star com.	2	..	4

New York Stock Exchange Quotations

APRIL 22, 1927

	High	Low	Last
Ajax Rubber, com.	11¼	10⅞	11⅛
Fisk Rubber, com.	19¼	18⅝	18¾
Goodrich, B. F., Co., com. (4)	56	55⅜	55½
Goodyear Tire & Rubber, pfd. (7)	108¼	108	108¼
Goodyear Tire & Rubber, pr.pfd. (8)	109⅜	109⅛	109¾
Kelly-Springfield Tire, com.	26⅜	24	26
Kelly-Springfield Tire, 6% pfd.	73	73	73
Kelly-Springfield Tire, 8% pfd.	73	73	73
Keystone Tire & Rubber, com.	5/8	½	½
Lee Rubber & Tire, com.	8¼	8¼	8¼
Miller Rubber, com. (2)	36½	35⅝	36⅜
Norwalk Tire & Rubber, com.	3⅞	3⅞	3⅞
United States Rubber, com.	63	61¼	62½
United States Rubber, 1st pfd. (8)	110¼	109	109

FIRE RISK IN RUBBER FLOOR TILING?

Manufacturers of rubber floor tiling, as well as construction companies, are questioning a recent decision of Supreme Court Justice Peter A. Hatting, who has ruled that rubber tiling as well as certain other materials have been installed in various New York buildings in violation of a section of the Building Code. This code decrees that in buildings more than 150 feet high the flooring shall be of incombustible material or of fireproofed wood. It is contested, however, that rubber tiling can be considered merely as "floor covering" and also that, with concrete underfloors and steel construction, the rubber flooring would not burn from underneath. Heat might cause it to buckle from expansion at a high temperature, and also such flooring, if subjected to a direct fire on its surface would burn under intense heat and if it contained a great amount of rubber in its composition.

Cigarettes or cigars dropped while still burning will leave no mark on a rubber floor. Also such ingredients as marble dust, clay and mineral colors make the floor less liable to burn, other ingredients such as pitch, oils, paraffin, fiber, and some oil or vegetable colors will burn if subjected to a direct heat for some time. The old interlocking type of rubber flooring was considered fireproof. Generally speaking, rubber may smolder and cause odor, but not any worse than rugs or carpets.

RUBBER DIVISION RESEARCH

The Physical Testing Committee under whose direction cooperative researches at the Bureau of Standards are being conducted is constituted as follows:

J. E. Partenheimer, The Fisk Rubber Co., chairman; E. R. Bridgewater, E. I. duPont De Nemours & Co.; E. B. Curtis, United States Rubber Co.; J. W. Schade, The B. F. Goodrich Co.; N. A. Shephard, The Firestone Tire & Rubber Co.; A. A. Somerville, The R. T. Vanderbilt Co.; W. W. Vogt, The Goodyear Tire & Rubber Co.; P. L. Wormeley, Bureau of Standards.

The researches relate to the effect of variations in temperature and relative humidity on the stress-strain and tensile properties of vulcanized rubber. The work is in charge of F. E. Rupert and the expenses of the investigation will be borne by the firms represented by the members of the committee.

GUAYULE INDUSTRY OF SALTILLO, MEXICO

All of the guayule rubber produced in the Saltillo district, Mexico, is exported, according to the Department of Commerce, to the United States. There was some revival in the industry during the last quarter of 1926, when more labor became available. The declared exports from the Saltillo district are as follows:

	1925	1926
	Pounds	Pounds
1st quarter	450,000	469,700
2nd quarter	650,000	590,000
3rd quarter	600,000	298,700
4th quarter	450,000	350,000

New Incorporations

B. & L. RUBBER CO., INC., March 22, 1927 (New York), capital $10,000. Incorporators: Sigmund Faust, 2685 Grand Concourse; Max Reich, 233 Broadway; and Frank Klienholz, 291 Broadway, all of New York City. Principal office, Bronx, New York. To deal in auto accessories, etc.

BRANCH BROOK SERVICE STATION, INC., January 27, 1927 (New Jersey), capital of $100,000, divided into 1,000 shares of the par value of $100 each. Incorporators and officers: Leon C. Richtmyre, president, 211 Prospect street, S. Orange, New Jersey; Michael Cicenia, vice president and treasurer, 326 North Fifth street; and Stephen Tiensch, secretary, 28 North Tenth street, both of Newark, New Jersey. Principal office, 255 Park avenue, Newark, New Jersey. To deal in automobile tires, tubes and accessories.

ENDURANCE RUBBER CO., February 25, 1927 (New Jersey), capital stock $100,000 preferred stock of the par value of $100, and 2,000 shares of common stock without par. Incorporators: Clement E. Eckrode, and Conrad Sebolt, Jr., both of Highland Park, New Jersey; and Conrad Sebolt, New Brunswick, New Jersey. Principal office, 320 Commercial avenue, New Brunswick, New Jersey. To manufacture and deal in tires and other rubber goods.

FASS, INC., December 18, 1926 (New Jersey), capital stock $25,000. Incorporators: Meyer Feldman, 437 Highland street, South Amboy, New Jersey; Morris Shevelowitz and Nathan Shevelowitz, both of 146 Pine avenue, South Amboy, New Jersey; Peter Abeille, 41 Luffberry avenue, New Brunswick, New Jersey. Principal office, George street and Pine avenue, South Amboy, New Jersey. To manufacture tires, tubes, patches, etc.

GARDNER TIRE & RUBBER CO., INC., April 5, 1927 (New York), capital $10,000. Incorporators: Irving Rabinowitz, Simon Katz and William W. Kapell, all of Brooklyn, New York. Principal office, Kings County, New York. To deal in tires, tubes, etc.

JACK AND JERRY TIRE STORES, INC., March 24, 1927 (New York), capital $20,000. Incorporators: Jack E. Rosen, Belrose; Philip Holland, Hempstead; and Albin N. Johnson, Freeport; all of New York. Principal office, Hempstead, New York. To deal in auto tires, accessories, etc.

KENREIGN CO., INC., March 30, 1927 (New York), capital $50,000. Incorporators: D. P. Godwin, Brooklyn, New York; A. Skillman, 120 Broadway; and A. J. Johnston, both of New York City. Principal office, 57th street and First avenue, Brooklyn, New York. To manufacture and distribute practically all types of rubberized rain wear, including men's, women's and children's raincoats, capes, hats, etc.

ROSELLE AUTO SUPPLY & TIRE CO., INC., February 9, 1927 (New Jersey), capital stock $50,000. Incorporators: Herman Tepper, Helen Tepper, Marion Mandel, and William Mandel, all of 343 St. George avenue, Roselle, New Jersey. Principal office, 343 St. George avenue, Roselle, New Jersey. To manufacture automobile tires and other rubber goods.

S. & D. ACCESSORIES, INC., April 19, 1927 (New York), capital $10,000. Incorporators: William Stessin and Max Davidson, both of 1255 Westchester avenue; and Philip L. Hoch, 1025 Bryant avenue, all of the Bronx, New York. Principal office, Manhattan, New York. To deal in auto tires, accessories, etc.

STANWIX TIRE CORP., April 19, 1927 (New York), capital $20,000. Incorporators: R. E. Sheldon, 431 West Market street, Akron, Ohio; L. R. Rufe, 145 Hotel street, Utica, New York, and O. J. Clarke, 7225 Lindell street, St. Louis, Missouri. Principal office, Utica, New York. To deal in auto tires, accessories, etc.

TIRE & BATTERY SERVICE, INC., March 4, 1927 (New Jersey), capital $50,000, divided into 500 shares of the par value of $100 each. Incorporators: William Zorrer and Julia Zorrer, 174 South 8th street; Russell C. Palumbo and Louise M. Palumbo, 2 Record street; all of Newark, New Jersey. Principal office, 787 S. Orange avenue, Newark, New Jersey. To deal in automobile tires and accessories.

TWIN CITY TIRE CO., INC., March 11, 1927 (New York), capital $10,000. Incorporators: James H. Draucker, 205 Bryant street; Walter W. Witte, 254 Niagara street; and Ralph Stumpf, 9 Delaware street, all of North Tonawanda, New York. Principal office, North Tonawanda, New York. To manufacture tires.

VAN DILLEN TIRE CO., INC., March 21, 1927 (New Jersey), capital stock $125,000, divided into 1,250 shares of the par value of $100 each. Incorporators: David Van Dillen and Mabel A. Van Dillen, 353 Colfax avenue, Clifton, New Jersey; and A. Lawrie Young, 225 Watchung avenue, Montclair, New Jersey. Principal office, 24 Prince street, Paterson, New Jersey. To deal in automobile tires, etc.

WATERPROOF POCKET CORP., March 23, 1927 (New York), capital stock of 150 shares of common stock and 350 shares of preferred. Incorporators: Sam Paull, president, 2244 Broadway; Abraham Ellman, vice-president, 149 West 27th street; Saul Mandeltort, and Samuel Silverman, all of New York City. Principal office, 321 Broadway, New York City. To manufacture a patented waterproof pocket for use in connection with a bathing suit.

WEINBERG TIRE CORP., April 1, 1927 (New York), capital $100,000. Incorporators and officers: Herman Weinberg, president, and A. Weinberg, both of 904 Park avenue; Edward J. Weinberg, treasurer, and A. M. Weinberg, both of 114 Ryckman avenue, all of Albany, New York. Principal office, 159 Central avenue, Albany, New York. To wholesale and retail automobile tires and accessories.

HOOVER TO ADDRESS TRADE CONVENTION

The fourteenth National Foreign Trade Convention will be held May 25-27 at Detroit, Michigan, and one of the leading addresses on this occasion will be given by Herbert Hoover, Secretary of Commerce. More than forty speakers, prominent in all phases of the country's foreign trade, are expected to participate in the convention's various sessions.

THE BIENNIAL CENSUS OF MANUFACTURES TAKEN IN 1926 includes in its statistics regarding "cotton small wares" the following data regarding elastic webbing: value of 1923 products, $25,774,000 and for 1925, $24,306,000, or a loss of 5.7 per cent. It is further stated that some of the cotton small ware figures are preliminary and subject to correction.

The Rubber Industry in America

New York

The Spadone Machine Co., 15 Park Row, New York, N. Y., manufacturer of bias fabric cutting equipment, has added to its line a belt press cleaning machine and a new type of hose wrapping machine.

The Hartol Products Corporation, specializing in the manufacture of rubber solvents, has announced the removal of its offices from Newark, New Jersey, to 117 Liberty street, New York, N. Y.

The Continental Rubber Company of New York and affiliated companies have removed to their new offices in the General Motors Building, Broadway and 57th street, New York, N. Y.

Lawrence & Co., sales agents for the products of several tire fabric mills, have renewed their lease on the property at 24 Thomas street, New York, N. Y., where the company's offices have for some time been located. Under the new arrangements the entire building is leased, as well as an annex on Duane street, while various improvements are to be installed.

The Wallach Rubber & Shoe Co., Inc., 137 West Broadway, New York, N. Y., wholesale jobber specializing in rubbers and tennis shoes, has recently increased its capitalization, but otherwise the company's management and policy remain unchanged.

Edward Maurer, crude rubber dealer, has removed his offices to the Roebling Building, 117 Liberty street, New York, N. Y.

The American Process Co., specializing in driers used in the production of reclaimed rubber, has removed its offices from 68 William street to the Roebling Building, 117 Liberty street, New York, N. Y.

The Michelin Tire Co., Milltown, New Jersey, reports that E. H. Swingler has been appointed district manager of the company's upper New York State territory, while H. W. West has been placed in charge of the company's Syracuse district.

Dovan Chemical Corp., 30 Church street, New York, N. Y., recently granted to E. I. duPont de Nemours & Co. and the American Cyanamid Co. licenses to manufacture, sell and use disubstituted guanidines as accelerators of rubber vulcanization under the claims of U. S. patent No. 1,411,231 and Dominion of Canada patents Nos. 227,316 and 247,133. These companies together with the Roessler & Hasslacher Chemical Co. now constitute the licensees under these patents. All disubstituted guanidines purchased from them or the Dovan corporation may be freely used in the vulcanization of rubber.

Poel & Kelly, Inc., 347 Madison avenue, New York, N. Y., crude rubber importers, will discontinue their Akron office after May 1. F. A. Lahey, who has represented the firm in Akron for the past twenty-two years, will return to the home office in New York City. Mr. Lahey is the oldest crude rubber man in Akron, and is widely known in that section of the state.

R. E. Ludowici, director of Stokes-McGown, Ltd., New South Wales, Australia, manufacturer of sporting goods, has just completed a tour of the United States, having visited the rubber centers and manufacturers of raw materials.

E. B. Germain, president of the Dunlop Tire & Rubber Co., Buffalo, New York, states that sales to dealers during 1927 of Dunlop tires are about double in number those of a year ago. Retail sales by dealers to motorists are also reported to be well above those of last year. Mr. Germain states that he does not anticipate any increases in tire prices as long as the present raw material prices continue.

The Utica Spinning Mills, at Utica, New York, a tire fabric plant representing a subdivision of the Dunlop Tire & Rubber Corporation, Buffalo, New York, has for several months been running on a twenty-four hour schedule.

The Century Rubber Works, 54th avenue and 18th street, Chicago, Illinois, reports that Louis N. Einsel has been appointed branch manager at Buffalo, New York.

The Gates Rubber Co., Denver, Colorado, reports that Rappole & Robbins, Inc., Jamestown, New York, are distributers of Vulco tires and tubes, the territory including southwestern New York and northwestern Pennsylvania.

Philip C. Jones, formerly electrical engineer with Goodyear in Akron, is now in the research department of the Bell Telephone Co., New York, N. Y.

The New Jersey Zinc Co., 160 Front street, New York, N. Y., announces the following change in personnel: J. A. Singmaster, general manager of the technical department and Frank G. Breyer, chief of the research laboratory in Palmerton, Pennsylvania, have resigned. Earl H. Bunce, formerly assistant chief of research, has been advanced to chief of research.

Southern

The Tucker Duck & Rubber Co., Fort Smith, Arkansas, specializing in Peerless camp furniture, is increasing the capacity of its plant, while a night and day schedule is also being maintained. The organization has branch warehouses in the cities of Dallas, Houston, Oklahoma City, Chicago, and Minneapolis. H. T. Tucker is president.

The Bibb Manufacturing Co., Macon, Georgia, specializing in the production of tire fabric, is making some necessary changes in two of its mills, and is also renewing and replacing some of the plant machinery. William D. Anderson is president.

The Goodyear Tire & Rubber Co., Akron, Ohio, has been constructing a new two-story building in New Orleans, Louisiana, which will supply this division with better warehouse and office facilities. Improvements represent a cost of approximately $75,000 while the floor space covers 25,000 square feet.

The Cord Tire Corporation, Chester, West Virginia, is now manufacturing about 1,500 tires daily, or an increase of more than 50 per cent over the output of a year ago. Production is to be raised within the next few weeks to 2,000 tires daily.

The Miller Rubber Co., Akron, Ohio, has contracted with the Callaway Mills, Inc., for the entire output of tire fabric produced at one of the latter company's plants at Athens, Georgia. The combined research facilities of the two organizations represent an interesting and important feature, the Callaway cotton laboratory being considered one of the most complete organizations in the South.

The Seiberling Rubber Co., Akron, Ohio, reports that H. C. Kirk, formerly associated with the Firestone organization, is now the Seiberling representative in the Louisville, Kentucky, territory.

The Miller Rubber Co., Akron, Ohio, has established its Baltimore, Maryland, branch in commodious quarters at 1307 St. Paul street. O. F. Schaefer, formerly associated with the company's Philadelphia branch, is in charge of the Baltimore division.

New Jersey

Conditions are improving in the rubber industry of New Jersey and the majority of the Trenton plants are running to capacity. Orders for tires and tubes are increasing and it is expected that with good weather this branch of the industry will be kept busy. Hard rubber orders also show some improvement, and sales of heels and soles are increasing. Plants manufacturing jar rings are very busy.

The Rubber Manufacturers' Association of New Jersey held its spring meeting on April 12 at the Trenton Country Club. Following the banquet, A. L. Viles, general manager of the Rubber Association of America, gave a talk on the condition of the rubber industry in general.

The Pierce-Roberts Rubber Co., Trenton, New Jersey, has added two new products to its output, the handy battery filler, and a cover for automobile distributers.

The Bates Tire Service, 120 South Warren street, Trenton, New Jersey, handles Hood tires and tubes. The Monument Tire Store, 310 North Broad street, sells Dunlop products. The Public Service Tire Shop, 116 South Warren street, handles Michelin tires and tubes.

John S. Broughton, former president of the Globe Rubber Tire Manufacturing Co., and the Woven Steel Hose & Rubber Co., was honored recently at the silver jubilee of the Supreme Forest, Tall Cedars of Lebanon, Trenton, New Jersey. Mr. Broughton served in the lodge for twenty-five years.

The Murray Rubber Co., Trenton, New Jersey, announces that business in all departments is very good and that sales are increasing each month. "Business has picked up considerably," said an official of the company, "and we are pleased with the outlook. We expect a good summer in tires, tubes and mechanical goods."

The Luzerne Rubber Co., Trenton, New Jersey, reports that business has begun to show a little improvement in the hard rubber line.

The Ajax Rubber Co., Trenton, New Jersey, is now operating between 75 and 80 per cent capacity and reports a large stock of tires and tubes on hand.

Joseph O. Baur, secretary of the Thermoid Rubber Co., Trenton, New Jersey, has returned from a business trip to the Pacific Coast, and reports that business is gradually improving. While away he visited the various western branches of the Thermoid Co.

The Combination Rubber Co., Trenton, New Jersey, is very busy and orders are increasing for tires and tubes. The plant is now running to capacity.

The Thermoid Rubber Co., Trenton, New Jersey, is running to capacity in all its departments. There is a large demand for brake lining.

Lawrence H. Oakley, president of the Vulcan Recovery Co., Trenton, New Jersey, recently gave a talk on "Lighthouse Reminiscences" before the members of the Trenton Y. M. C. A. Mr. Oakley spent his boyhood days in and about lighthouses in Cleveland and Ashtabula, where his father was keeper of both lighthouses.

James W. Thropp, treasurer of the John E. Thropp's Sons Co., Trenton, New Jersey, and Miss Lillian White Ivins, also of Trenton, were recently married in New York City.

The Goodyear Tire & Rubber Co., dealers of Trenton and vicinity, recently held a dinner in Trenton, New Jersey. E. C. Schick, manager of the Philadelphia branch, and B. J. Keating, his assistant, were the speakers. They described the new type of balloon tire now being placed on the market.

The Rubber Manufacturers' Association of New Jersey during a meeting on February 8 presented John A. Lambert, former president of the organization, with a silver bowl, in recognition of his efforts to further the interests of New Jersey manufacturers and also as a token of the affection and personal esteem in which he is held by his fellow members. Mr. Lambert, who was one of the originators and charter members of the association, has just completed two terms as president, being succeeded by Frank D. Voorhees, vice president and treasurer of the Voorhees Rubber Manufacturing Co., Jersey City, New Jersey.

Midwest

The Chicago Rubber Clothing Co., Racine, Wisconsin, reports that a customer recently returned a raincoat which had been made in 1903, the following statement accompanying the returned goods: "We are sending you a twenty-year-old coat for the reason that one of our customers, who wore this coat twenty years or more, would like to have another like it, size 46."

The International Shoe Co., 1505 Washington avenue, St. Louis, Missouri, is preparing to build an addition to its present rubber heel plant. The organization intends to manufacture its own rubber soles, and will expend $250,000 or more on the construction of the new three-story building.

The Security Rubber & Belting Co., 2837 South La Salle street, Chicago, Illinois, reports an order for a "Serubco" rubber transmission belt which is believed will be when completed the largest specimen of this type of equipment in the United States. The belt of 72 x 12 ply, will measure 142 feet and 6 inches and will handle approximately 1,100 h.p. and will weigh about one and a half tons.

The Huetter-Premier Machine Co., 7755-7761 Dix avenue, Detroit, Michigan, recently organized with a capital of $257,500, has leased a factory for the manufacture of inner tube splicers. The organization is also planning to equip a rubber department, where molded electrical insulation will be produced, hard and soft rubber and bakelite being utilized. A. Huetter, the president of the organization, has spent twenty years of his business career as a rubber engineer and executive.

The Michelin Tire Co., Milltown, New Jersey, states that E. J. Fitzgibbon, Jr. is now manager of the company's St. Louis district.

The Century Rubber Works, 54th avenue and 18th street, Chicago, Illinois, reports that J. E. Breon has been transferred as branch manager to the company's Kansas City division. Robert Stubbins has succeeded Mr. Breon as manager of the branch at Minneapolis, Minnestoa, while Jean Mandeloff is in charge of the division at Detroit, Michigan.

The Minneapolis Tire Dealers Association reports that J. B. Williams, of the Twin City Rubber Tire Co., Minneapolis, Minnesota, has been elected president. Mr. Williams' partner, H. C. Baker, is secretary of the National Tire Dealers' Association.

The Milwaukee Truck Tire Distributors' Association states that H. D. Detienne, president and treasurer of the Wisconsin State Rubber Co., 181 Fourth street, Milwaukee, Wisconsin, has been reelected president. The Wisconsin organization carries a full line of tire accessories as well as Mohawk tires and tubes.

Massachusetts

Massachusetts rubber factories have been running along at a better rate than most of the local industries, although slack conditions in several lines have been contributory to dullness in rubber. Tires, tubes, carriage cloth, hard rubber, and extruded rubber are enjoying good volume. State figures show the rubber goods group, which includes tires and tubes, but not footwear, to be running full time. Rubber footwear plants are operating on a five-day week, although advance bookings for next winter are heavy. As cold weather last winter came early, the whole season was advanced, and schedules were reduced as the consumer demand fell off. The early spring weather has stimulated tennis sales, although the volume is not as large as five years ago owing to the competition of turn and stitchdown leather shoes. The chief outlet for tennis today is for specific athletic purposes. Very shortly the shoe factories will shift their schedules to gaiters as the novelty complexion to this type for next year necessitates well planned production to guard against the danger of the present styles becoming obsolete.

H. Traiser & Co., Inc., manufacturer of the "Harvard" and "Pippin" cigar in Boston, are now celebrating their 75th anniversary, making them the oldest cigar manufacturers in New England. Charles H. Traiser, president of this concern, is also president of the Elmhurst Rubber Co., Elmhurst, Long Island, manufacturer of molded specialties and druggists' sundries.

C. H. Baker, formerly vice president of the Firestone Footwear Co., Hudson, Massachusetts, has joined the Bourne Rubber Manufacturing Co., footwear manufacturers, Providence, Rhode Island, where he will begin his duties immediately as vice president.

John M. Bierer, technical superintendent of the Boston Woven Hose & Rubber Co., Cambridge, Massachusetts, sailed April 17, 1927, for England, where he will deliver an address before the Institution of the Rubber Industry at London on May 2. He will visit many of the British factories on his trip and return to this country June 5.

M. J. Gallant, formerly of the Converse Tire & Rubber Co., Malden, Massachusetts, has incorporated the Gallant Rubber Co. and opened a tire store in Somerville, Massachusetts, where he will handle President and Alpine tires and tubes, Converse products. Mr. Gallant has the best wishes of his many friends who have watched him surmount many obstacles despite his affliction of total blindness. William Rooney, formerly a tire service man with Converse, has joined Mr. Gallant's organization, which opened for business April 1.

The Ninigret division of The Fisk Rubber Co., New Bedford, Massachusetts, reports that C. P. Harrington has been appointed general manager, succeeding Henry Otte, resigned.

E. Norman Bowry, purchasing agent of the Simplex Wire & Cable Co., Cambridge, Massachusetts, has been nominated for the presidency of the New England Purchasing Agents Association, the election to be held at the annual meeting in May at the University Club, Boston.

Hood Rubber Co., Watertown, Massachusetts, is experiencing renewed activity in both footwear and tire departments. Results of the fiscal year ending March 31st will not be known for several weeks, but decreased earnings are freely predicted in financial circles owing to shrinkage in inventory values of both raw and finished goods. The 4 per cent dividend on the common stock is being maintained.

E. J. Samuels, formerly connected with the sales departments of Goodyear and Ajax, is now manager of the merchandising division of The Fisk Tire Co., with headquarters at Chicopee Falls, Massachusetts.

Everlastik, Inc.

Everlastik, Inc., manufacturer woven and braided rubber elastic, with plants at Chelsea, Massachusetts, and Pawtucket, Rhode Island, has filed the following financial statement as of December 31, 1926:

ASSETS

	1926	1925
Real estate	$791,091	
Machinery and equip...	1,051,869	$2,718,305
Merchandise	937,420	924,575
Notes receivable	5,012	
Accounts receivable	351,771	387,575
Cash	274,212	497,847
Securities	49,865	144,383
Deferred charges	318,156	238,742
Patent rights and copyrights	286,664	961,305
Good will and trade marks	675,282	
Treas. stock	.....	77,950
Total	$4,741,344	$5,950,368

LIABILITIES

[1]Capital stock	$3,583,100	$3,731,650
Mortgages	938,800	996,800
Accounts payable	188,368	153,614
Surplus	3,076	52,758
Reserves	28,000	1,015,546
Total	$4,741,344	$5,950,368

[1]On February 15, voted to change the 19,000 authorized shares of common stock to the same number of no-par value shares.

Precourt Products Co., with factories at Mansfield, and Reading, Massachusetts, reclaims tires and tire beads. William E. Precourt is president and treasurer.

Charles O'Hearn has been appointed production manager of the Firestone Footwear Co., Hudson, Massachusetts, according to press reports. He will make his headquarters in the eastern states.

The Hodgman Rubber Co., Framingham, Massachusetts, is producing a varied line of camping and sporting goods, including air mattresses, air pillows, and "Zephyrweight" fishing waders.

The Panther Rubber Co., Stoughton, Massachusetts, is planning, it is said, to concentrate the manufacture of its Panco products at the Panco plant at Chelsea, Massachusetts. The output of other goods at the Stoughton factory will be increased. H. J. Lucier is general manager.

Pennsylvania

George W. Daum, vice president and general manager of the Pennsylvania Rubber Co., Jeannette, Pennsylvania, has resigned. Coming from the Goodrich company in 1909, Mr. Daum has held the following positions with the Pennsylvania organization: cost manager, assistant superintendent, superintendent, production manager, and since April, 1924, vice president and general manager. After twenty-seven years in the rubber industry, Mr. Daum intends to take a vacation, and has not yet announced his plans for future business.

The Victor Balata & Textile Belting Co., Easton, Pennsylvania, is preparing plans for a two-story addition to its plant, the new construction to cost approximately $120,000.

The Michelin Tire Co., Milltown, New Jersey, announces that R. Marquet has been placed in charge of the company's Pittsburgh territory.

The Goodyear Tire & Rubber Co., Akron, Ohio, moved on April 15 its Philadelphia branch from its former location at 2551 North Broad street to a three-story building at 2750 North Broad street. The new headquarters contain 86,000 square feet of floor space.

The Standard Rubber Tire Co., Philadelphia, Pennsylvania, will handle casings manufactured by The Star Rubber Co., Akron, Ohio. The distributing organization has been in business for a number of years.

The Vulcan Rubber Co., Erie, Pennsylvania, George B. Wingerter, receiver, has announced that on May 9, 1927, at 2:00 P. M. there will be a public sale at the company's plant of raw materials, finished goods, etc.

Ohio

After doing a greater volume of business in the first three months of the year than in any previous first quarter, the Ohio rubber industry continued on an even keel during April. Most companies are producing at about the same rate as in March, while some factories curtailed operations slightly in tire departments to avoid danger of overproduction. A few manufacturers, affected by special conditions, increased tire output in April. In the Akron district tire production is approximately 130,000 casings a day, the early spring weather having stimulated tire sales. Talk of higher tire prices has also been a beneficial factor in the retail trade.

Goodyear is still pushing production to meet the heavy demand for its new balloon tire. Employes have been notified that summer vacations will probably be postponed, owing to the need of maintaining capacity operations. President P. W. Litchfield announced that Goodyear produced 4,030,656 casings during the first three months of 1927. March production was the heaviest in Goodyear's history. Over 1,500,000 tires and 1,700,000 tubes were manufactured during the month. Sales of the new Goodyear balloon tire passed the million mark before the end of March.

Although exact figures were not given, Firestone and Miller have scored gains in sales volume of 100 per cent during the quarter over the corresponding 1926 period. Goodrich has exceeded tire production expectations so far this year, and reports a heavy demand for tennis shoes and mechanical rubber goods. Capacity operations have been the rule at the General, Seiberling, India and Mohawk plants. The excellent showing made in the early months of the year forecasts a production of 70,000,000 tires this year as compared to 60,000,000 in 1926.

Company earnings have been fair during the first quarter, but not what they should be because tire prices are below pre-war levels. This fact is generally recognized and a tire price advance is expected in the near future. Many companies have new tire price lists prepared for release to the dealer trade.

Rumors regarding the merger of a large automobile corporation and one or more tire companies have not been taken seriously in Akron. At prevailing low prices motor companies can buy tires from rubber manufacturers cheaper than they could make them.

Akron Rubber Production

Akron, the rubber center, now stands second in Ohio in value of manufactured products and wages paid, according to the 1925 Bureau of Census report. Cleveland, the fifth city in the country and the first in Ohio, still leads by a wide margin. Cincinnati, which formerly held second place, is now in third position. Akron produces daily more than 125,000 pneumatic casings, 175,000 inner tubes, 150 tons of solid tires, 30 miles of garden and fire hose, 25 miles of conveyer belting, 500 miles of rubber bands, 25,000 pairs of rubber boots and shoes, and 1,000,000 rubber heels. In addition, hundreds of tons of other rubber articles are produced daily.

Development Engineer

The rapid growth of the rubber industry, especially in the tire branch, is the result of the work of many rubber technologists on both the chemical and engineering sides. James W. Brundage, one of the many rubber development engineers, was identified for over 10 years with one of the leading Akron companies. Mr. Brundage is a native Pennsylvanian, born in 1887. He was an engineering student for two years at Carnegie Institute of Technology, Pittsburgh. Previous to entering the rubber field his engineering work was done in connection with the American Steel & Wire Co. and the American Reduction Co. at Pittsburgh. As manager of the experimental department of the Miller Rubber Co., Akron, Ohio, his work related to mechanical development and machine designs as well as process engineering. Recently Mr. Brundage joined the staff of John R. Gammeter, 680 North Portage Path, Akron, Ohio, and will be identified with this organization in general rubber machine development.

J. W. Brundage

The B. F. Goodrich Co., Akron, Ohio, reports that H. K. Raymond has retired from the Board of Directors, and J. D. Tew was made a director to fill the vacancy on the board. All other directors whose term of office expired were reelected. V. I. Montenyohl, assistant treasurer, was appointed treasurer, L. D. Brown continuing as vice president, in charge of finance. It was voted to retire 11,880 shares of preferred stock in accordance with the charter provisions.

Reidar Marcussen, salesman for H. Astrup & Co., Firestone distributers for Norway, has returned to that country, after spending several months at the Firestone-Akron factory.

Goodyear Friars Club presented their organization's eleventh annual minstrel show in Goodyear Hall, Akron, Ohio, April 2, 4 and 5.

The Swinehart Tire & Rubber Co., Akron, Ohio, has been awarded $25,505 for damages to the company's property by an overflow of the Ohio canal in June, 1924. The award was made by the state board of sundry claims.

E. R. Jobson, of Firestone's export department, has been named manager of the Firestone sales agency for Chile, Bolivia and Peru.

V. A. Cossler has been appointed technical superintendent of The B. F. Goodrich Co., Akron, Ohio, succeeding Walter Evans, now with the R. T. Vanderbilt Co., New York, N. Y.

P. G. Hoover has been named sales representative of the Columbus branch of the Firestone Tire & Rubber Co. in the eastern Ohio district, replacing L. F. Hessman.

John F. Palmer, pioneer in the development of the cord tire principle, is now consulting and development engineer with the Seiberling Rubber Co., Akron, Ohio.

Rubber Service Laboratories Co., Inc., Akron, Ohio, has been sued by the Goodyear Tire & Rubber Co. for alleged infringement of certain accelerator patents held by Goodyear. The suit is directed against the Rubber Service Laboratories' accelerator, Z-88.

Harriss, Irby & Voss, New York cotton brokers, have taken over the branch office maintained in the Ohio building, Akron, Ohio, by Henderson Brothers and Co., rubber brokers of New York, N. Y. H. H. Henderson is manager, and will handle transactions in stocks, cotton, grain and rubber.

Carl L. Beal, formerly of the Research laboratory of the Eastman Kodak Co., Rochester, New York, is doing development work on the electrodeposition of rubber for The B. F. Goodrich Co., Akron, Ohio.

The Seiberling Rubber Co., Akron, Ohio, recently held a conference of its branch office managers, there being many representatives present from all sections of the country. As a result of this conference, a new plan was developed regarding a uniform system of reports which, it is believed, will greatly increase the efficiency of branch operation.

Lucian L. King, formerly advertising manager for the Goodyear Tire & Rubber Co., will start an independent outdoor advertising agency in Akron.

Fred R. Meade, of Zanesville, Ohio, has been appointed office manager of the Goodyear Tire & Rubber Co.'s branch in Havana, Cuba.

Akron Standard Mold Co., Akron, Ohio, is occupying a new addition, built to take care of increased business on automatic watch case vulcanizers of tires and tubes. A. J. Fleiter is vice president and general manager.

A. D. Bowen is the new Akron district manager for the India Tire & Rubber Co., according to the announcement of C. C. Prather, general sales manager. He had previously been covering the Florida territory.

The Rubber Products Co., Barberton, Ohio, filed a voluntary petition in bankruptcy April 16 in the Federal Court at Cleveland, and probably will be sold at private sale as a going concern, according to C. Blake McDowell, receiver. The company manufactured druggists' sundries, gloves, molded goods and tube machine products.

R. H. Peters, H. M. Hopkins and E. V. Nagy are new additions to the sales force of the Falls Rubber Co., Cuyahoga Falls, Ohio.

Miller Balloon Corp., Crestline, Ohio, has taken over the business of the McQuate Rubber Co., Marion, and the defunct Highland Rubber Co. The firm makes toy balloons.

Walter G. Rennick, of Millersburg, Ohio, who has been appointed receiver for the McKone Tire & Rubber Co., will operate the plant.

Arthur O. Roberts has been appointed manager of eastern territory for the Auburn Rubber Co., Auburn, Indiana. He was formerly advertising and sales promotion manager for the Star Rubber Co.

Akron Rubber Reclaiming Co., Barberton, Ohio, reached a new high production record in March, according to William Welch, general manager. The plant is running at capacity, with three shifts employed.

New Tread Tire & Rubber Co., East Palestine, Ohio, has sold the factory building at Columbiana, Ohio, to the P. & O. Service Co. Bondholders now plan to dispose of the tire concern's two plants in East Palestine.

Giant Tire & Rubber Co., Findlay, Ohio, reports a substantial increase in sales during the first three months of 1927. Considerable new territory has been opened up in the South, according to F. C. Burk, secretary and sales manager.

Columbia Tire & Rubber Co. stockholders at recent annual meeting reelected all directors and officers. The outlook for 1927 is encouraging, according to W. B. Martin, president.

Central Rubber Reclaiming Co., Findlay, Ohio, has completed additions which will double present production. J. F. Schaefer is president, and C. F. Bushong, general manager.

The Premier Rubber Manufacturing Co., Edmund street and Michigan avenue, Dayton, Ohio, specializing in the production of mechanical rubber goods, hard rubber and bakelite products, reports that Charles Armstrong is now the company's manager of sales in Michigan and northern Ohio, with headquarters at Detroit, Michigan. Mr. Armstrong has for some fifteen years been associated with the rubber industry and he now has charge of the Premier company's sales of molded automobile parts made of hard and soft rubber, cut washers, molded sundries, extruded work, etc. L. Strobeck is general manager of the Premier organization.

The Dayton Rubber Manufacturing Co., Dayton, Ohio, reports a steady increase in sales during the first three months of the present year, the most profitable year in the history of the organization. Business during January and February was almost treble that for the same two months of 1926, while March has been a record month, both from the dollars and cents standpoint, and from units sold. John A. MacMillan is president and general manager.

The Triangle Tire & Rubber Co., Canton, Ohio, reports that sales during 1926 were 42 per cent greater than for the preceding year, while those of the first three months of 1927 are over 30 per cent higher than for the corresponding months of 1926. The present output includes about 600 tires daily, and approximately 400 tubes of the molded, seamless and spliceless type. Warehouses are maintained in San Francisco, Milwaukee, Kansas City, and Atlanta. W. C. Wyatt is assistant treasurer.

The Star Rubber Co., Akron, Ohio, recently elected the following executives at its annual meeting: M. E. Mason, president; W. A. Boesche, vice president; J. W. Dessecker, secretary, and R. G. Shirk, treasurer.

The Monarch Rubber Co., Hartville, Ohio, began work on April 1 with an increase in schedule, as the present output of 500 casings daily is to be advanced to 750. The organization has recently completed two new factory units and installed new equipment in them. These additional buildings will be used for storage and mill purposes.

The Polson-McWade Rubber Co., Cleveland, Ohio, has, according to press reports, appointed the Western Auto Supply Co. as a distributer of the puncture-sealing tubes manufactured by the first-mentioned organization.

The Republic Rubber Co., Youngstown, Ohio, is said to be making important changes in its plant in order to reduce the handling cost of crude rubber. These improvements include the installation of a mechanical conveyer system and the erection of a new storage warehouse. The company's truck tire department is reported as operating at full capacity, the average for the entire plant being at 85 per cent capacity.

Mason Tire & Rubber Co., Kent, Ohio, has completed the installation of equipment in its new power plant. A brick stack towers 150 feet over the buildings with the word "Mason" emblazoned in four-foot letters.

This New Building, 60 x 70 Feet, Provides Offices and Additional Factory Space for The Akron Equipment Co., Akron, Ohio

The Rubber Service Laboratories, Akron, Ohio, has added to its sales division staff Arl Lewis, for four years chemist with the New Jersey Zinc Co.

The Medina Rubber Co., which specializes in the manufacture of tire boots, gum covered and cement patches, liners and tire repair kits, has moved to larger quarters on West Smith Road, Medina, Ohio.

T. C. Marshall, formerly vice president and factory manager of the Kelly-Springfield Tire & Rubber Co., has returned to Akron after an absence of seven years. It is reported that he is forming a company to operate the Knox Tire & Rubber Co. plant at Mt. Vernon, Ohio.

The Oak Rubber Co., Ravenna, Ohio, is maintaining in its well-equipped factory a production of 300,000 toy balloons daily.

The World Rubber Co., Inc., Wadsworth, Ohio, has been organized for the purpose of manufacturing toy balloons, although in the near future mechanical rubber goods will also be produced. W. W. McQuate, formerly president of the McQuate Rubber Co., is general manager. Other executives include: N. Braley, president; Mrs. N. Braley, vice president; and R. K. Braley, secretary and treasurer.

President of Star Rubber Co.

Morris E. Mason, who has recently been made president, director, and general manager of The Star Rubber Co., Akron, Ohio, has been connected with the rubber industry throughout his entire business career.

Born in Winona, Minnesota, Mr. Mason received a high school education, and in March, 1897, began work in Chicago and in Detroit as a salesman with the Morgan & Wright Co., now a division of the United States Rubber Co. During his fourteen years with the Morgan & Wright organization, Mr. Mason was successively manager of the bicycle tire, carriage tire, and truck tire departments. From 1911 to 1913 he remained in Chicago as assistant to the central district manager of the United States Tire Co., another change occurring in 1913 when he became one of the organizers of the Mohawk Rubber Co., Akron, Ohio. During his eleven years with the latter organization he held such positions of responsibility as sales manager, secretary, vice president and director. Since beginning his work in Akron Mr. Mason has been an active participant not only in the development of his own organization but has also witnessed the astonishing growth of the city as a great rubber center.

The new president of the Star company has at present no affiliation with the clubs of Akron, but is a member of the Masonic order. He resides at 194 North Highland avenue, Akron.

Pacific Coast

The American Rubber Manufacturing Co., Park avenue and Watt street, Oakland, California, recently installed much additional machinery and made a considerable extension to its plant in order to take care of rapidly increasing business, especially in hose and belting. The working force is also being increased. W. R. Goudie, recently manager in Denver for the Republic Rubber Co., has just been appointed representative for Southern California and Arizona. N. S. Dodge is president.

The Sound Rubber Co., Tacoma, Washington, has not been sold, according to J. E. Berkheimer, receiver. If a satisfactory proposition to take over and operate the plant is not received soon, a recommendation may be made for an order to auction the assets to meet creditors' claims.

The Rainier Pulp & Paper Co. started operations last month in its new sulphite mills at Shelton near Puget Sound, Washington, one of the largest plants of its kind in the Northwest.

The Burrow Manufacturing Co., Spokane, Washington, makers of the Burrow boot for tires and various automobile rubber accessories, reports a 50 per cent increase in sales for the first quarter of the year. The new officers are: President-Manager, J. H. Burrow; vice president, C. C. McSpadden; secretary, F. H. Fuller; all being directors with J. D. Morrissey and O. S. Riggs.

The Goodyear Rubber Co., 539 Mission street, San Francisco, California, announces that because of ill health R. H. Pease, who has long been president, has retired from active service, and his place will be taken by L. C. Garrigus as president in Portland, Oregon, and Howard Middleton as president in San Francisco. The latter has been manager for several years. J. A. Shepard continues as vice president and C. F. Runyon as secretary. The entire capacity of the factory is devoted to manufacturing dredger sleeves, general mechanicals, and specialties.

The California Textile Products Co., Monrovia, California, is the latest concern on the Pacific Coast to manufacture cotton duck for rubber goods makers. The heads of the concern were formerly connected with the California Cotton Mills, a large producer of similar goods, in Oakland; and the looms used are part of the fine equipment of the Imperial Cotton Mills, formerly operating in Los Angeles.

John G. Gates, secretary-treasurer of the Gates Rubber Co., Denver, Colorado, recently visited several of the largest tire distributers on the Coast and then left for a six-weeks' trip to the Hawaiian Islands.

The Goodyear Tire & Rubber Co.'s branch manager at Spokane, Washington, B. F. Michel, has been transferred to the Portland, Oregon, branch, being succeeded in Spokane by Earl Whipple.

The General Tire & Rubber Co., Akron, Ohio, has increased its roll of Southern California dealers to seventy-five, one being allowed to each city or town, according to C. E. Criss, southwest district manager.

The Burton-Wade Rubber Co., Los Angeles, California, of which E. W. Hendrick is manager, and which recently moved from 1920 East Vernon avenue to 717 East 61st street, where a building was erected to order, has installed a vulcanizing equipment with full-circular molds and having a capacity of 100 tires a day. The company makes rebuilt tires, tire boots and shoes, reliners, etc., and deals in rubber scrap.

The B. F. Goodrich Rubber Co., Akron, Ohio, has just appointed F. F. Harkins, formerly in the advertising department, as branch manager in San Francisco at 650 Second street. E. S. Sargeant, general credit manager, and Charles B. O'Connor, sales promotion manager, both of Akron, have recently been visiting the company's main branches on the Pacific Coast.

The West American Rubber Co., 400 North Avenue 19, Los Angeles, California, has rebuilt with steel trusses and corrugated iron the sections of its mills recently damaged by fire and added new equipment. According to President Douglas Radford, the company is rushed with export orders for oil field supplies, especially super hose, and is doing an exceptionally good business in standard mechanicals and specialties.

The Hamilton Rubber Manufacturing Co., Trenton, New Jersey, reports that Frank C. Braden, general sales manager, has been making a personal study of trade conditions on the Pacific Coast and remarks that no section of the country has shown such a marked increase in sales of Victor-Springfield tires as the Southwest.

The Yaffe Tire Shoe Co., Hyman Yaffe, president, announces that production and working force will be doubled with the completion of the new factory being built at Pacific boulevard and Chambers street. The plant will cost $40,000 and machinery $10,000 more, and capacity will be five tons of tire shoes daily. They are made from old tires, of which the company used some 2,000 tons last year.

Sears-Roebuck Co., Chicago, Illinois, has established an immense distributing plant in Los Angeles, and is introducing new marketing methods, featuring low prices on tires and other rubber goods. The company is planning an aggressive selling campaign to include the whole Pacific Coast territory.

T. A. Willard, of the Willard Storage Battery Co., Cleveland, Ohio, electrical engineer, inventor, and author, has been studying trade in the Southwest and incidentally buying a winter home at 617 Linden avenue, Beverley Hills, California.

P. H. Goodall, assistant sales manager, Mohawk Rubber Co., Akron, Ohio, who has been conferring with branch managers and distributers from Los Angeles to Seattle, reports a notable increase in business on the Coast as compared with the spring season of 1926.

The Spreckels "Savage" tire plant, at Main and Sicard streets, San Diego, California, has not yet been disposed of, but the greater part of the large accumulation of casings and tubes has been sold, according to William Clayton, vice president of the J. D. & A. B. Spreckels Securities Co., who has charge of the liquidation of the estate of the late John D. Spreckels, who had financed the factory.

H. O. Bock, general assistant to Los Angeles Branch Manager J. B. Magee of the United States Rubber Co., has been spending a couple of weeks in Arizona developing sales. The company's business throughout the entire Coast territory has picked up considerably during the past month. Much of the improvement is credited to improved weather conditions, although good salesmanship also figured largely. Rubber insulated wire, which the company heretofore marketed chiefly through jobbers, is being sold in rapidly increasing volume directly through the company branches, and despite keen competitive conditions.

The Coast Tire & Rubber Co., East 12th street and 50th avenue, Oakland, California, notes a decided improvement in sales and conditions more encouraging than at any time since the concern was reorganized nearly two years ago. In addition to a standard line of high pressures, the factory now makes many sizes of balloon tires. J. C. Hughes is president, L. S. Budo vice president, and E. H. Russell secretary and treasurer.

E. B. Moore, Berkeley, California, states that plans are being made and ample capital assured for the erection of a cotton textile mill in the San Francisco bay region involving an expenditure of several million dollars. Especial consideration will, it is said, be given to the manufacture of cotton duck and cord tire fabrics for which there is a rapidly growing demand among rubber goods makers between the Rocky Mountains and the Coast. Preference will be given, it is also said, to alcala cotton raised in California.

The Firestone Tire & Rubber Co., Akron, Ohio, conducted at the Biltmore Hotel, Los Angeles, California, early in April an educational convention for dealers, and at which seventy-two were present. It was followed with a banquet. Addresses were made by Los Angeles Branch Manager R. J. Cope and Pacific Coast Division Manager C. V. Jones, formerly of Akron and now permanently located at San Francisco. The dealers were advised, among other things, that Firestone 1926 sales were $144,000,000; that daily production is 40,000 casings, 44,000 tubes, and 50,000 rims; and that over 20,000 acres will be planted this year on the projected million-acre rubber plantation in Liberia.

California Goodyear Activities

Goodyear Tire & Rubber Co., Los Angeles, California, reported mid-April production averaging 8,000 tires and 8,200 tubes daily, and the big mills operating at full capacity. The new type of balloon tire was said to be the strongest seller. The outlook for the early summer is said to be excellent. Much new equipment is being installed to take care of the expected increase in demand. Recent visitors at the plant have included E. R. Preston, manager, and P. K. Coe, division manager, bus transportation sales, of Akron, Ohio, and C. F. Bronner, of Butte, Montana, and W. H. Vining, of El Paso, Texas, both branch managers.

The executive officers of the California Goodyear Company for 1927 are: President, John W. Mapel; vice president and general superintendent, H. E. Blythe; treasurer, J. S. Willaman; secretary, H. J. Young; assistant secretary, J. L. Goddard; directors, E. G. Wilmer, Frank L. Espenhain, H. J. Young, John W. Mapel, J. E. Jardine, J. K. Hough, P. W. Litchfield, H. E. Blythe, and J. S. Willaman.

The 1927 executive staff of the Goodyear Textile Mills is: President, John W. Mapel; vice president and general superintendent, H. E. Blythe; treasurer, J. S. Willaman; secretary and comptroller, H. J. Young; assistant secretary, J. L. Goddard; directors, E. G. Wilmer, H. J. Young, Charles H. Toll, John W. Mapel, J. S. Willaman, Reese Llewellyn, P. W. Litchfield, H. E. Blythe and H. F. Stewart.

The Goodyear Textile Mills, Los Angeles, California, earned during 1926 a net profit of $237,505, after all charges, including Federal taxes, had been deducted.

The Credit Tire Co., Oakland, California, was established three years ago for the purpose of selling Hood tires and tubes on the time payment plan and at cash prices. The organization now controls twelve stores in Oakland, Berkeley, and San Francisco, California; with branches at Sacramento and Los Angeles, California; Tacoma, Washington; and Portland, Oregon. A. Goldstein is president.

The Goodyear Tire & Rubber Co., Akron, Ohio, reports that P. W. Senour, formerly manager of the company's branch at Toledo, Ohio, is now affiliated with the sales manager in the Los Angeles offices of the California company, but is not manager of the Los Angeles division, as incorrectly stated in the April issue of the INDIA RUBBER WORLD. J. L. Amsdell is also connected with the San Francisco branch in the capacity of mechanical goods salesman, but is not in charge of the division's mechanical goods department.

The Columbia Tire Corp., Portland, Oregon, announces the retirement of R. A. Wurzburg as president, he having been succeeded by William Cornfoot; and of Lewis Wyman as treasurer, his successor being K. C. Mohrhardt, who also acts as secretary. Alfred A. Aya remains as vice president, but has been relieved of active duties as sales manager by W. L. McNerney, who was with **The B. F. Goodrich** Rubber Co. for eight years. J. F. Cullen is manufacturing manager.

The MacDonald-Dodson Tire Co., 1317 South Hope street, Los Angeles, California, distributer of Falls tires, maintains branch stores in Pasadena and in Santa Monica. The organization reports an increase of 46 per cent in its January sales, as compared with the corresponding month of the year previous. L. O. Dodson is president.

The National Tire Stores, Inc., an organization beginning business last year in Los Angeles, California, has now established its twenty-second division at 2219 Ninth avenue, Seattle, Washington, while executives of the company state that during 1927 forty additional stores will be opened. Divisions have been organized at Dallas, Pueblo, and Wichita, as the company is now working eastward, while stores have been already established on the Pacific Coast at San Francisco, Seattle, and Stockton. Negotiations are also going forward for locations in Oklahoma City and Kansas City. H. K. Myers is manager of the Seattle division.

H. E. Noonan has been placed in charge of the branch maintained at Salt Lake City, Utah, by the Firestone Tire & Rubber Co., Akron, Ohio. Mr. Noonan has been connected with the Firestone sales organization for about ten years.

Canada

Reductions from one to three or four per cent have been announced on mechanical rubber goods including water, steam, air drill, pneumatic, mill and suction hose, as the result of the sales tax revision. Garden and lawn hose prices will remain unchanged but a rebate of one per cent will apply on this line. First and second grade belting shows a price reduction of about 2 per cent. Reductions in tire prices have stimulated business considerably and there are rumors abroad of another price decline. Many dealers have received their spring shipments and are prepared to handle the brisk business resulting from an early spring weather.

Retailers in the Montreal district have not carried over any great quantity of lawn and garden hose, and manufacturers and jobbers are now shipping orders to dealers who desire to have seasonal lines in stock. Usually the footwear season opens March 3, but this year it began on February 15. Prices for light weight rubbers are much the same but rubber boots and some of the heavier lines have declined about 10 per cent.

Gregory Tire & Rubber 1926 Ltd., Port Coquitlam, British Columbia, according to Managing Director R. E. Jamieson, is looking forward to prosperity in 1927. The daily tire output is much higher than before, and the policy to produce only goods of the best quality is much appreciated by dealers. Not only is domestic business improving, but export trade is showing a good increase every month. The officers of the reorganized company are: President, R. I. Cliff; vice president, A. M. Dollar; managing director, R. E. Jamieson; secretary-treasurer, J. S. Full; directors, F. E. Burke, W. C. Shelly, Hugh Dalton, E. A. Riddell, J. H. McDonald, T. D. Trapp, and Fraser Jamieson.

N. M. Lynn, of the Ames-Holden McCready Rubber Co., Ltd., Montreal, returned recently from a visit to Boston, where he visited the plant and showrooms of the United States Rubber Co.

A. Koehler, general sales manager of the Canadian Goodrich Co., Ltd., Kitchener, Ontario, is most optimistic regarding present conditions, and states that the demand for women's low overshoes in various color combinations was heavy this season and will be greater next winter. A phenomenal increase in the sale of high and low Zippers was noticeable.

Independent Rubber Co., Ltd., Montreal, has opened a branch in the Maritime Provinces at Moncton, New Brunswick, under the management of A. B. Carty with J. P. Gorman in charge of sales, assisted by A. F. Hire.

C. H. Black, Dunlop Tire & Rubber Goods Co., Ltd., Toronto, at the recent annual meeting of the Canadian Society of Cost Accountants held in Toronto was elected a director of the organization.

W. J. Anderson Manufacturing & Rubber Co., Ltd., London, Ontario, has acquired a branch factory at Sherbrooke, Quebec, where all kinds of rubber goods will be manufactured.

A Quebec tire dealer's shop contains the following hung in a conspicuous place: "If you buy your tires from the mail order house go to the post office for air."

Ed Cochrane is again on the road for the Great West Rubber & Footwear Co., Lethbridge, Alberta, and has taken a permanent sample room in Calgary.

John Myles, vice president and general manager of the Columbus Rubber Co. of Montreal, Ltd., recently returned from a successful business trip in the Maritime Provinces.

Miner Rubber Co., Ltd., Montreal, was a recent contributor to the prize list of the Hockey Carnival Night held at the Forum for the benefit of the Children's Hospitals.

Canadian I.T.S. Rubber Co., Ltd., of Toronto, has opened a branch at 120 Lombard street, Winnipeg, Manitoba.

D. E. Rogerson, Dunlop Tire & Rubber Goods Co., Ltd., Toronto, is on the directorate of the Canadian Bicycle Dealers' Association, Ontario Section.

Rubber Manufacturers Association of British Columbia entertained the Tire Committee of the Retail Merchants Association of British Columbia at a banquet held recently at the Grosvenor Hotel, Vancouver. J. E. Stephenson, manager of the Vancouver branch of the Goodyear Tire & Rubber Co., of Canada, Ltd.; A. R. Higgins, chairman of the British Columbia tire companies; H. A. Wells, Dominion Rubber Co., Ltd.; J. Scott, Dunlop Tire & Rubber Goods Co., Ltd.; J. Dunsmuir, Firestone Tire & Rubber Goods Co. of Canada, Ltd.; G. R. Donaldson, Canadian Goodrich Co., Ltd.; W. G. Fowler, Gutta Percha & Rubber, Ltd.; R. E. Jamieson, Gregory Tire & Rubber Co., Ltd.; H. D. McClenhan, K & S Tire & Rubber Goods Co., Ltd.; all spoke favorably of the improved trade conditions and offered the same cooperation as in the past.

The Rubber Association of Canada elected the following officers for the ensuing year: President, John Westren, Dunlop Tire & Rubber Goods Co., Ltd., Toronto; vice president E. V. BeSaw, Firestone Tire & Rubber Goods Co. of Canada, Ltd., Hamilton; treasurer, C. N. Candee, Gutta Percha & Rubber Co., Ltd., Toronto; assistant treasurer, Joseph O'Mara, K & S Tire & Rubber Co., Ltd., Toronto; manager, A. B. Hannay, Toronto. Board of Directors in addition to above, C. H. Carlisle, Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto; W. A. Eden, Dominion Rubber Co., Ltd., Montreal; F. L. Freudeman, Sterling Rubber Co., Ltd., Guelph; T. B. Tompkinson, Canadian Goodrich Co., Ltd., Kitchener; and J. D. Hathaway, Northern Electric Co., Ltd., Montreal.

BUDDED RUBBER

Outside of the Dutch East Indies, budded rubber is regarded with a good deal of suspicion yet by a large section of the planting community. In a recent issue of the *Planters' Chronicle*, a planter airs some theories to support his skepticism where budded rubber is concerned.

First, he calls attention to a few statements made by Mr. Bicknell on the subject in an article printed in the paper quoted. These statements were to the effect (1) that undesirable characteristics appear to develop, (2) that yields for successive seasons have not been maintained and (3) that brown bast is more prevalent. Then he recalls that alternate daily tapping or tapping once in the three days gives a greater yield than daily tapping, while at the same time brown bast is more prevalent with the last system. The reason for this he presumes is that with more frequent tapping the tree is unable to produce latex as fast as it is drawn off, the cells are not so fully charged, and, as they are not called upon to function to normal capacity, brown bast gains a footing.

This leads to the theory, that the root-system of, say a 20-ring stem, used as stock for a 60-ring bud graft, cannot support the 60-ring stem eventually developed for any length of time. It may be able to fill its 60-ring stem in the interval between budding and tapping, but it is questioned whether the root system of the 20-ring stock could continue to do this for any length of time.

The writer concludes, that, at best, withdrawing latex is an unnatural process for the tree and that in addition "to put a top-heavy structure onto a comparatively weak foundation does not appear to be right somehow."

The Rubber Industry in Europe

Great Britain

Tire Import Duty

Financial experts claim that British markets are exhibiting a stronger and more confident tone, while with the seasonal spring demand there is a continued trend toward expansion in the chief British industries, the coal, iron and steel, cotton and shipbuilding trades being especially active. Automobile sales show a steady improvement, while British rubber manufacturers are particularly interested in the fact that under the McKenna system a new ad valorem duty of 33⅓ per cent is now imposed not only on motor cars imported into the United Kingdom, but on tires as well. This duty on tires will however be rebated to products from the British Empire to the extent of one-third of the general rates. Thus, American factories in Canada will pay only 22 2/9 per cent duty on tires imported into England.

Institution of the Rubber Industry

The fifth annual dinner and dance of the Institution of the Rubber Industry took place on March 24, 1927, at the Connaught Rooms, Great Queen street, London, W.C.2, Lord Colwyn, president of the organization, being chairman. Among the 180 members and guests attending were Sir Stanley Bois, the past president of the Institution; Sir Robert Horne; Sir George Beharrell, chairman of the India Rubber Manufacturers' Association; and Sir Henry Wickham.

After proposing the toast "The Institution of the Rubber Industry" Sir Robert Horne paid a special tribute to Sir Henry Wickham, and later reviewed the development of the plantation industry. In responding, Lord Colwyn mentioned the work of the Institution and its opportunities for service. H. Eric Miller proposed the toast of "Kindred Associations," saying that these represented the Rubber Growers' Association, the Rubber Trade Association, the India Rubber Manufacturers' Association, the Cable Makers' Association, the Asbestos Association, and the Research Association of British Rubber and Tire Manufacturers. Mr. Miller also suggested that the Association of British Motor Manufacturers might be included, as their work in the production of motor cars was so closely connected with that of the rubber industry. In replying to Mr. Miller's toast Sir George Beharrell made the announcement that the Congress of the World's Transport Agencies, which for the past three years has been held in New York City, will this year be held in London. As the congress will take place in connection with the coming Commercial Vehicle Show, the occasion should be of importance to both the motor and rubber industries. The two final toasts, proposed by Sir Walrond Sinclair and Sir Stanley Bois were "The Guests," and "The President."

The London Section of the Institution held an interesting meeting on April 4 at the Engineers' Club, the chief address being made by H. Eric Miller, who took as his subject "Rubber Statistics." A council meeting of the Institution is to be held on May 13, while on the same day the committee which is preparing the program for the coming year will hold its special session.

Traffic Markers

Rubber blocks for marking white traffic lines are being satisfactorily used in various sections of the country, the manufacturers being the Universal Rubber Paviors, Ltd. One of the most important thorofares laid with these blocks is in the city of Manchester, where, in spite of heavy traffic, and after twelve months of hard usage, the condition of this particular street is said to be excellent. Other towns using these traffic markers for street crossings and in various sections are: Romford, Greenford, Kensington, Bradford, Rochdale, Brighton, Liverpool, Epsom, Bristol, Aldershot, Littleborough, Stratford, etc. An interesting experiment is being tried out in Atherton, where the stone is being set with a rubber composition supplied by Universal Rubber Paviors.

Dunlop Activities

The annual report of the Dunlop Rubber Co., Ltd., covering the calendar year 1926, shows that total net profits for the twelve months have reached £2,401,801, while the various additions to the reserve fund have raised that total to £2,100,000. In spite of losses due to the coal strike, the organization states that the plants at Fort Dunlop and Rochdale are now running at capacity to meet record demands, while the factories both in England and abroad were never in better condition, this also applying to the Macintosh group of companies. The progress of the American company is considered most satisfactory, and for the first time that organization has been able to report a small profit on its operations, after providing for full depreciation on its plant and buildings. The British company has declared a dividend of 20 per cent on its common stock, payable June 1.

British Notes

Vultex, Ltd., has concluded an agreement with the United States Rubber Co. with regard to the former's American patents. The agreement is however of a reciprocal nature, and leaves the Vultex organization free to develop its interests independently in the United States. The Vultex patents cover the vulcanization of rubber latex, the process having been invented by Philip Schidrowitz. Under the registered trade mark "Vulpro" rubber goods are being manufactured in England.

The R. T. Vanderbilt Co., Inc., 50 East 42nd street, New York, N. Y., U. S. A., specializes in the manufacture of various rubber compounding ingredients, the company's sole selling agent in the United Kingdom being the Anchor Chemical Co., Ltd., of Manchester. Dr. A. A. Somerville, associated with the Vanderbilt organization, has been making a special study of anti-oxidants, and "Ohm Oil" is the trade name of a compound, patented, and especially produced by him for the purpose of impregnating paper-wrapped cables for carrying electric current at high voltage.

The first of the series of Gow Lectures on the Colloid Chemistry of the Rubber Industry will be given in May by Dr. E. A. Hauser, under the auspices of the University of London.

Holland

During 1926 Holland imported 5,173 tons of plantation rubber, value 11,820,000 guilders. Since 2,556 tons, value 5,783,000 guilders, were re-exported, the quantity of plantation rubber actually consumed during the year comes to 2,617 tons. The number of automobile tires imported totaled 131,897, value 6,166,000 guilders. America was the most important source and supplied 46,577 tires, France supplied 31,085 and Great Britain 23,426. Of the 104,186 automobile tire tubes imported, 36,101 came from America. There, too, France followed pretty closely with 35,517. Motorcycle tires came to 7,337, value 109,000 guilders, and solid tires to 2,048, value 205,000 guilders. Other tires ag-

gregated 1,026,767, value 1,861,000 guilders; Belgium, France and Great Britain, in the order named being the chief sources of supply.

The corresponding tubes numbered 685,453, value 570,000 guilders. Of the 1,270,693 pairs of shoes, representing a value of 1,149,000 guilders, imported during the year, America contributed only 33,929 pairs against 492,207 pairs by Belgium, 301,969 pairs by France, 216,620 by England and 191,692 by Germany. Entries of fabrics and webbings combined with rubber totaled 420 tons, value 1,376,000 guilders, and clothing thereof, 76 tons, with a value of 588,000 guilders.

Director Netherlands Rubber Institute

The Netherlands Government Rubber Institute, Delft, Holland, is the official research station for the Dutch rubber plantation industry, and is in charge of Director Arnold van Rossem. Last year

A. Van Rossem, Ph.D.

American rubber chemists and technologists had the pleasure of meeting this eminent rubber chemist when he took part in the program of the Rubber Division meeting at Philadelphia.

Professor Van Rossem was born September 14, 1887, and is a native of Deventer, Holland. He was educated in the schools at the Hague, entering the Technical University at Delft from which he was graduated in chemical engineering in 1912 and attained his doctorate in technical science in 1916 at the same university. For one year, 1912-13, he was assistant at the University of Utrecht. In 1915 he became assistant at the Netherlands Government Institute and became its director the following year. He is a member of the Society of Chemical Industry, London, and the Netherlands Chemical Society, having served as the treasurer of the latter from 1922 to 1925.

Dr. van Rossem's contributions to the technology of rubber include studies of viscosity, depolymerization and oxidation of raw rubber; testing crude rubber; the vulcanization process; distillation of scrap rubber; the mechanical properties of calendered sheets; and the chemistry and industrial applications of latex.

Germany

The tire industry was among the few industrial groups for which production statistics were compiled in 1925. The following results have been published.

The figures cover 33 factories producing all kinds of tires except for horse-drawn vehicles, baby carriages, etc. For six of this number, experts have worked out estimates. Of the 33 factories, 19 are in Prussia, 5 in Hessen, 2 in Baden and one each in Bavaria, Württemberg, Thuringia, Braunschweig, Waldeck, Hamburg and Bremen. The average number of persons employed in these factories was from 10,000 to 12,000. The materials used, including crude rubber, chemicals, reclaim, steel rims, fabric, etc., represented a value of 140,273,000 marks. Of this amount, 57 per cent went for rubber and about 30 per cent for fabric.

The value of the total output in 1925 came to 208,130,000 marks. The quantities and types of tires produced, home consumption and export were as follows:

	Total Output	Home Consumption	Exports
Pneumatic Tires for Passenger and Delivery Cars			
Covers	1,019,517	840,043	132,894
Tubes	1,092,701	839,745	170,341
Tires for Trucks and Omnibuses			
Giant Pneumatics			
Covers	72,599	58,742	2,568
Tubes	75,738	56,657	2,935
Elastic (hollow) Tires with Steel Rims	76,060	64,723	4,834
Solid Tires with Steel Rims	172,228	130,437	29,574
Tires for Wagons and Tractors			
Solid Tires with Steel Rims	23,498	22,267	.....
Tires for Motorcycles			
Covers	285,306	289,460	12,756
Tubes	313,114	301,914	17,035
Bicycle Tires	10,927,530	9,314,241	1,056,903
Tubes	11,807,676	8,561,618	2,819,018

It will be noted that by far the greatest part of the output, about 90 per cent of the total value, remained in the country.

The Leipzig Spring Fair

The impression carried away from the Leipzig Spring Fair just ended is one of renewed activity and optimism. It is all the more gratifying to be able to say this since reports of fairs held during the last few years had been increasingly disappointing. But at last business seems to have definitely taken an upward swing in Germany and is once more on a sound basis. And this was reflected in the satisfactory amount of orders booked by exhibitors of various lines including rubber goods.

This time too, the fair bore a really international character, respectable numbers of foreigners being present, some as exhibitors, but most as buyers.

Competition was as keen as ever and while Germany seems to be able to hold her own in most respects, the matter of credit remains a weak spot. Germany is, for the present at least, unable to extend the generous credit terms that are customary from British and American concerns.

Nevertheless, satisfactory sales were made especially in surgical goods, active interest being shown also by foreign buyers. In fact, it was stated that 70 per cent of the inquiries came from abroad. The demand for made-up rubber goods, rubberized fabrics, was also active, and substantial orders for rubber aprons for England were booked, while seamless rubber goods were in request by the East. As usual, much of the interest centered in the toy department where novelties again attracted special attention.

Novelties at the Fair

The Zieger & Wiegand A.-G., Leipzig, offered most natural looking cakes and pastries made of rubber, which were deservedly popular. The firm also showed a new massaging apparatus known as the "Massage-Doctor," which is constructed on the principle of the Swedish two-finger method and being flexible, easily conforms to any part of the body. They also had a roller specially constructed for massaging the legs. These two types of massaging apparatus, it was said, roused special interest among buyers.

The Mittelland Gummiwerke, A.-G., Hannover-Linden made a decided hit with a life-size doll. It will be remembered that this firm recently produced a new kind of rubber mass from which small figures were molded. At the present fair, the firm showed dolls to a height of about three feet made of this material, the modeling being particularly successful so that much is expected of this novelty.

Gummiwarenfabrik Saul, G. m. b. H., Aachen, had besides football bladders and balls for water sport a new ball of the latter type made of rubberized fabric in brilliant colors, instead of pure rubber. The new ball has the advantage of being cheaper than the all-rubber kind. This firm has secured manufacturing rights for Germany of the English Aquaplane Bubble-boat.

Werner and Pflederer, Cannstatt-Stuttgart, exhibited a novelty in the shape of a hydraulic rubber cleaver. This is particularly adapted to splitting and separating large blocks of plantation sheet.

French Company Notes

Société Française du Surmoulage du Pneumatique (Ancienne Maison A. Nebout) has been formed to retread tires. Offices are maintained at 14 rue des Moines, Paris.

Société Agenaise du Caoutchouc will also chiefly undertake the retreading of pneumatic tires. The firm is capitalized at 400,000 francs and will maintain headquarters at 29 Cours Washington, Agen.

The Rubber Industry in the Far East

Malaya

The failure of rubber prices to rise and at least remain around 1 shilling, 9 pence, per pound, in spite of the fact that the exportable percentage has been cut to 70 per cent and may be cut to 60 per cent by May 1, has caused rubber producers to carefully examine their position. The results of this examination are very far from satisfactory and have resulted in toning down much of the optimism aired a little while ago even though prices were following a constant downward course.

Even so firm an optimist as A. W. S., late of the *Straits Times*, in writing to his old paper from London is constrained to say: "I am still hopeful that price will improve, but it is necessary to draw attention to certain facts which tend to produce uneasiness."

Then he goes on to enumerate these facts, the first being the report of the United States Federal Bank on the situation in December, 1926, particularly concerning the great falling off in automobile production in that month. The easy credits in America since 1920 have brought about conditions predisposing to panic and it is because these are particularly prominent in connection with the automobile industry that he draws attention to their possible reaction on the rubber industry. However, other reports incline to the view that possibly attempts are being made in America to avoid recklessness.

Other facts tending to produce uneasiness, writes A. W. S., are increasing stocks in London and uncertainty as to standard production in Malaya. It seems that reports in London are to the effect that standard will be 330,000 tons for Malaya, which is very much more than the country can produce and will tend to neutralize the action of restriction to a great extent.

The fifth restriction year, he continues, was started with about 40,000 unused coupons given perpetual currency, with standard predicted at 29,000 tons higher, with stocks in London increased by 35,000 tons and in America by 20,000 tons, total handicap 124,000 tons. A handicap big enough to cause uneasiness. If the unused coupons are used, it may cause a good deal more than that for they constitute a serious factor when the exportable percentage is substantially below the power of production.

"I hope," he adds, "that prudence will prevail among producers and that the uneasiness about the American demand will pass away, but the first quarter of the restriction year has not improved prospects for the remaining nine months."

Which remark would seem to indicate that A. W. S.'s hopefulness is rather forced—for the time being at least.

Rubber Smuggling

For some time very little had been heard of rubber smuggling, but of late the preventive fleet appears to be having all its resources taxed by the task of checking smugglers. In three weeks' time, from February 16 to March 8, eleven captures were made and a total of 200.90 piculs or 26,787 pounds of rubber found on the boats seized. Undoubtedly the cuts in permissible exports which have been in force during the last half year, while prices are still sufficiently remunerative, are responsible for the renewed activity of smugglers.

As has frequently been pointed out in these columns there is no way of finding out even approximately what amount of smuggled rubber finds its way successfully into Sumatra and neighboring islands to be subsequently reshipped to Singapore as Dutch native rubber. Certainly, when captures are often made every day, the amount must be quite considerable, otherwise the frequent captures would render the business unprofitable.

This leads to an examination of native exports to Singapore and it certainly is rather striking to find that in the beginning of 1926 exports were below those for the corresponding period of 1925, although prices were considerably higher than in the latter period, but that as the year 1926 advanced and prices receded, exports actually increased to such an extent that the adverse difference as compared with 1925 exports which had been as high as 20 per cent was reduced to something like 2 per cent by the end of the year. And the increase is continuing as shown in the table below:

	Imported		Exported	
	1926 Tons	1927 Tons	1926 Tons	1927 Tons
January	10,237	14,992	30,452	34,946
February	8,306	11,694	30,440	27,528
Totals	18,543	26,686	60,892	62,474

Imports of native rubber, it will be seen, actually rose by 8,143 tons in two months, whereas the increase of total shipments from Malaya during the same period is only 1,582 tons. And again it should be pointed out that when the rubber reported as having entered Singapore in January and February, 1926, was harvested prices were still at their highest.

Not until rubber production is free again will it be possible to judge correctly of this condition, and not then even, because increases in Malayan output would naturally be ascribed to the beneficial effects of resting trees enforced by restriction, while lower outputs from the Dutch native sources would be accounted for by overtapping, or the activities of remilling works, or some such thing.

Ceylon

The annual report of the Ceylon Chamber of Commerce for 1926 has just been published and in the trade report attached, details regarding Ceylon's rubber trade in that year are given.

Total exports of Ceylon-grown rubber during 1926 came to 58,800 tons which is 13,103 tons more than was exported in 1925 when the total was 45,697 tons. The distribution of this rubber for 1926 and 1925 was as follows:

	1926 Tons	1925 Tons
Great Britain	18,260	12,149
Continent of Europe.....	2,777	2,599
America	36,442	29,893
Australia	1,083	896
Japan	140	98
Other countries	98	62
Totals.....	58,800	45,697

As usual America was the biggest customer, taking 62 per cent of the total shipments, against 65 per cent the year before. The United Kingdom took 31 per cent against 27 per cent the year before. In view of the growing stocks in London, this increase cannot be taken as due to larger demand from British manufacturers.

Latex shipments jumped from 3,750 gallons in 1925 to 13,096 gallons in 1926.

The exportable maximum and the average price for each quarter are given below:

1926	Per Cent	Price in *s. d.*
January	85	3.10.709
February-April	100	2. 4.103
May-July	100	1. 9.001
August-October	100	1. 8.199
November-December	80	1. 7.265

The quantities of rubber offered at auctions locally during 1926 came to 14,233 tons and the average price for top grades for the year was 1.21 rupees against 13,242 tons, with average price during 1925 for top grade at 1.73 rupees. Stocks of rub-

ber in the godowns of members of the Colombo Rubber Traders' Association were as follows:

	Tons
March 31, 1926	3,424
June 30, 1926	2,935
September 30, 1926	3,442
December 31, 1926	5,090

On July 22, the export duty on rubber was increased from 2½ cents to 4 cents per pound.

Freight rates during the year remained unchanged except to America, the rate being raised from 50 shillings to 55 shillings on December 1, 1926.

Restriction During 1926

At the annual meeting of the Chamber of Commerce, J. J. Wall, retiring chairman, reviewed Ceylon's trade in 1926 and had several interesting things to say on various subjects. Regarding rubber, and more particularly restriction, he said that an average price of 1.21 rupees per pound for top grades at local sales must be considered as very satisfactory. This of course did not mean that the downward trend of prices throughout the year could be accepted with equanimity, but it was the movement and general uncertainty rather than the prices that did not satisfy. Most estates, he said, could make very good profits at present prices, and he thought "that the raising of the pivotal price to 1 shilling 9 pence was hardly commensurate with the economic requirements of the trade."

In another place, in discussing the changes introduced in the application of the Stevenson Scheme in 1926, he stated that in spite of the profits obtained for the time being, it was generally agreed that for many reasons the high prices ruling in 1925 could not be held to have assisted the rubber industry in any way. As for the continuation of restriction on the whole he does not think that restriction should be removed at present; the time to do this would be when consumption more nearly approximated production.

The unused export coupons also claimed his attention and he informed his audience that the actual exports of Ceylon rubber from the beginning of restriction to the end of 1926, as shown by figures kept by the Chamber of Commerce, are about 4,500 tons short of the exportable maximum. In addition, licenses were issued to cover 11,800 tons declared as stocks on November 1, 1922.

Exports

Ceylon's exports of rubber during the fifth restriction year were as follows:

	Exportable Maximum Tons	Actual Exports: Ceylon Grown Rubber Tons	Imported Rubber Tons	Latex Gallons
November, 1926	4,923	4,228	321	904
December, 1926	4,923	6,498	618	...
January, 1927	4,923	6,753	404	...
February, 1927	4,307	3,306	208	...
Totals	19,076	20,785	1,551	904

Netherlands East Indies

Exports of estate rubber from East Coast Sumatra in 1926 were 54,946,777 kilos against 48,196,570 kilos the previous year.

Exports of native rubber from East Coast Sumatra fell from 15,711,863 kilos in 1925 to 14,373,001 kilos in 1926, a reduction of almost 10 per cent. However, this decrease is only for this particular territory, in other parts of the Dutch colonies it is not nearly so large so that in the end the total native exports of rubber were almost the same as in 1925, that is about 86,000 tons dry weight.

Attention is called in connection with the foregoing to the circumstance that official Malayan figures of imports of rubber from East Coast Sumatra into Malaya give a much higher figure than that noted above, namely 19,457 tons (Dutch figures give 14,373 tons). This was the case in 1925 too and the difference between the Dutch and Malayan figures cannot be explained!

The Amsterdam Langsa Rubber Co., it is learned, will turn out no dividends for 1926 because the rubber crop has been disappointing.

The first of the three factories which **The Netherlands Rubber Union** is building for the purpose of remilling native rubber, has begun operations. This factory is in Palembang.

Emka Process

The Emka process of preparing rubber, so-called from the initials of the inventors, van der Mark and Kremer, has been widely advertised here and was also a feature of the Netherlands East Indies exhibit at the International Rubber Exhibition, Paris. Although scientists in Paris treated the matter rather coolly, yet it is thought advisable to make more than passing mention of it here, if for no other reason than this that the well-known local scientist Dr. O. de Vries is an enthusiastic advocate of the new process. He lectured on the subject at a recent film-demonstration of the process held in the Botanical Gardens at Weltevreden under the auspices of the General Agricultural Syndicate, which body, it should be noted, is deeply interested in the process, so much so that it departed from its rule not to advertise new inventions and has made active propaganda for the Emka process.

In the course of his lecture, Dr. de Vries described the process which is nothing more than this: latex is allowed to coagulate in a shallow pan thus forming a slab or cake of coagulum which is folded double, closed all around by pressing with the fingers, only a small opening being left for the insertion of a tube connected with a pump by means of which the coagulum is inflated to the desired size. The inflation naturally stretches the rubber to a very thin film which dries rapidly in the sun. The balloon formed by inflation is dusted inside and outside with talcum, deflated, cut open and the film of Emka rubber is ready. The thin rubber film thus quickly and cheaply produced can be used for making sandals, ladies' shoes, toys, lamp-shades, tea-coseys, dolls, capes, motor-coats, hat and umbrella covers, all in the desired colors.

What Dr. de Vries had to say which seems to deserve special attention is that the system being so simple and cheap, is something that should prove very suitable for native producers. It is intended to experiment in this direction and to see whether the native could be interested in this process.

Dr. de Vries suggests that one way in which the big European estates might make use of the process would be to have the tappers, who now coagulate their latex themselves, inflate the coagulum and deliver dry rubber instead of latex.

Planting Notes

Dr. James R. Weir, pathologist in charge of mycological collections, Bureau of Plant Industry, United States Department of Agriculture, has accepted an appointment as plant pathologist for the recently-established Rubber Research Institute of Malaya, at Kuala Lumpur, Federated Malay States. In 1923 Dr. Weir was plant pathologist with the expedition sent out by the United States Departments of Commerce and Agriculture for investigating the sources of crude rubber in the Amazon basin.

Belgian Congo. According to official statistics Belgian Congo exported in 1925 326,639 kilos of plantation rubber, value 6,532,780 francs, and 442,595 kilos of wild rubber, value 4,382,795 francs. Most of this rubber came from the Upper Congo. Besides this, the following quantities entered Belgian Congo in transit: French Equatorial Africa plantation rubber, 26,810 kilos, value 475,369 francs; wild rubber, 1,570,444 kilos, value 12,016,087 francs; Angola, wild rubber, 10,914 kilos, value 95,440 francs; altogether, therefore, 1,608,168 kilos, value 12,586,896 francs.

Imports of manufactured rubber during 1925 included tires, 77,433 kilos, value 2,798,565 francs, and other articles including clothing, 46,494 kilos, value 878,093 francs.

Rubber Patents, Trade Marks and Designs

United States

March 15, 1927*

1,620,712 Inside protecting stay for leather-top rubbers. Leon L. Bean, Freeport, Maine.

1,620,743 Stocking protector. Lillian Stuart, New York, N. Y.

1,620,818 Tire flap. Joe Jacobs, Denver Colorado.

1,620,867 Collapsible boat. James F. Boyle, Hammondsport, New York.

1,621,021 Tire flap. Fred V. Medynski, Medford, Oregon.

1,621,149 Mattress and bed protector. William R. Blissit, Columbus, Georgia.

1,621,154 Tire repair device. David H. Cox, Roselle, New Jersey.

1,621,342 Attachment for arctics. James H. Webber, Carrolltown, Pennsylvania.

1,621,388 Tire flap. George H. Wheatley, Chicago, Illinois.

1,621,434 Doll's limb. Isaac A. Rommer, Brooklyn, New York.

1,621,455 Ballet slipper cover. Barney S. Bonaventure, New York, N. Y.

March 22, 1927*

1,621,550 Sponge. John Lehr, assignor to The Miller Rubber Co., both of Akron, Ohio.

1,621,898 Playing ball. George L. Pierce, Brooklyn, assignor to A. G. Spaulding & Brothers, New York, both in New York.

1,621,899 Playing ball. George L. Pierce, Brooklyn, New York.

1,622,211 Knee brace. Frank Sheehan, Ithaca, New York.

March 29, 1927*

1,622,322 Boxing glove. Daniel J. Kennedy, Yonkers, New York.

1,622,332 Inner tire valve. Domenico Marrazzo, Brooklyn, New York.

1,622,526 Dispensing tube. Samuel J. Lewis, Detroit, Michigan.

1,622,570 Aquatic toy. Charles H. Budde, St. Louis, Missouri.

1,622,848 Vehicle tire. Frank E. Rush, Detroit, Michigan.

1,622,850 Combined sink stopper and soap dish. William F. Schacht, Huntington, Indiana.

1,622,860 Rubber soled shoe. David A. Cutler, Wollaston, assignor to Alfred Hale Rubber Co., Atlantic, both in Massachusetts.

1,622,903 Medical appliance. John L. Cox, Plainview, Nebraska.

April 5, 1927*

1,623,210 Horse collar cushion. August H. Stahl, Grafton, Nebraska.

1,623,923 Tire boot and fastener. Clarence L. Johnson, Littleton, Colorado.

*Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

Dominion of Canada

March 15, 1927

268,994 Shock absorber. Arthur Bennett, Chilliwack, British Columbia.

268,996 Tire insert. Willis J. Benson, Douglas, Arizona, U. S. A.

269,086 Heel. The Evernu Rubber Heel Corporation, assignee of Arthur M. Eichorn, both of New York, N. Y., U. S. A.

March 22, 1927

269,165 Tire liner. Mike P. Finnegan, Newton, Mississippi, U. S. A.

269,179 Pneumatic tire. Samuel Roy Ingram, Philadelphia, Pennsylvania, U. S. A.

269,208 Arch support. William M. Scholl, Chicago, Illinois, U. S. A.

269,225 Box toe. The Beckwith Box Toe, Ltd., Sherbrooke, Quebec, assignee of William Beach Pratt, Wellesley, Massachusetts, U. S. A.

269,226 Weather strip. The D. W. Bosley Co., Ltd., of Canada, Montreal, Quebec, assignee of Maurice E. Bosley, Chicago, Illinois, U. S. A.

269,236 Tire. The Gummiwerke Fulda Akt. Ges., Fulda, assignee of Ludwig Harter, Dresden, both in Germany.

269,237 Tire. The Gummiwerke Fulda Akt. Ges., Fulda, assignee of Ludwig Harter, Dresden, both in Germany.

269,238 Vehicle wheel tire. The Gummiwerke Fulda Akt. Ges., Fulda, assignee of Ludwig Harter, Dresden, both in Germany.

March 29, 1927

269,410 Multiple fastener. The Dominion Rubber Co., Ltd., Montreal, Quebec, assignee of Daniel Francis Dalton, Waterbury, Connecticut, U. S. A.

April 5, 1927

269,486 Tire alarm. Isaac L. and Forrest J. Sinclair, both of Murphy, Oregon, U. S. A.

269,495 Pneumatic tire. Genaro Bayona, San Diego, California, U. S. A.

269,507 Pneumatic mattress. George Worthington Carr, Buffalo, New York, U. S. A.

269,611 Elastic webbing. The Ansonia O. & C. Co., assignee of George E. Clauss, both of Ansonia, Connecticut, U. S. A.

269,636 Advertising balloon. The Goodyear Tire & Rubber Co., assignee of James F. Cooper, both of Akron, Ohio, U. S. A.

269,677 Nursing bottle and nipple. Clarence J. Reilly, Ernest B. Norman and Edward S. Butler, each an assignee of one-third of the interest, all of New Orleans, Louisiana, U. S. A.

United Kingdom

March 2, 1927

263,957 Hand bag attachment. D. E. Bonus, 174, Upland Road, East Dulwich, London.

263,976 Road blocks. C. W. Taylor, 146, Queens Road, Watford, Hertfordshire.

263,992 Tire valves. M. G. Selbach, 337, Kennington Road, London.

264,073 Tire. F. A. Krusemark, Akron, Ohio, U. S. A.

March 9, 1927

264,160 Mud guards. F. A. D. Rouet, 92 Rue St. Denis, Colombes, France.

264,211 Electric inductances. J. Craig, 51, Brockman Road, Folkestone, Kent.

264,263 Diaphragm for acoustic instruments. Columbia Graphophone Co., Ltd., 102, Clerkenwell Road, and F. A. Mitchell, Bendon Valley, Wandsworth, both in London.

264,279 Universal joints. F. R. Simms, Percy Buildings, Gresse street, Rathbone Place, London.

264,362 Textile fabric with sponge rubber backing. A. E. Hemsworth, 124, Grove Road, King's Heath, Birmingham.

264,375 Sealing strip for trunk. Dus-Pruf Metal Trunk Co., and F. Paquette, Detroit, Michigan, U. S. A.

264,379 Cover for upper part of jolleying mold. W. H. Higham, 38, Lancaster Road, Birkdale, Southport, Lancashire.

264,387 Tire patching. R. D. Boyce, 149, Audley Road, Hendon, London.

264,390 Soothing teat. F. Schutze & Co., Ltd., and F. Schutze, Black Bull Works, Caledonian Market, London.

264,393 Combined gaiter and galosh. M. Heinemann, 130, High street, Portsmouth.

March 16, 1927

264,453 Foot arch support. J. May, 41, Hermannstrasse, Frankfort-on-Main, Germany.

264,555 Boot inserts. H. B. P. Humphries, 14, Old Queen street, Westminster.

264,638 Heel grip. F. Johnson, 14, Sparkenhoe street, Leicester.

March 23, 1927

264,762 Rotary shaft packing. M. Allen & Sons, Ltd., V. M. B. Allen, and T. W. Allen, Elsinore Road, Old Trafford, and J. P. Bates, Newlyn, Scarisbrick Road, Levenshulme, both in Manchester.

264,771 Spring shackles. W. W. Groves, 30 Southampton Buildings, London (International Motor Co., 25 Broadway, New York, N. Y., U. S. A.).

264,883 Wheel tires. P. T. Webb, 81 Bowhill Road, North New Brighton, Christchurch, New Zealand.

264,971 Draught excluder. W. H. Bolt, 242, Leeds Road, W. C. Garner, 1, Westgate, and F. Shuttleworth, 47 Buckrose street, all in Huddersfield.

264,994 Renewable tread for horseshoe. W. Dewhirst, 2, Hallfield Place, Bradford.

265,010 Stocking protector. H. C. Wood, Victoria Station House, Westminster.

265,021 License holder. J. T. Payne, Temple Products, Ltd., Canal street, Lancaster street, Birmingham.

265,050 Inflatable floating bodies. W. Hauser, trading as Rubberfabriek Holland, Velsen, Netherlands.

265,067 Braces. R. M. Kitto, 41, Kimberley Park Road, Falmouth, Cornwall.

265,076 Stencils. J. Bagnall and P. G. Copeman, 164, Dupont street, Toronto, Canada.

265,087 Pneumatic tire. L. E. Barbe, 7, Boulevard de l'Embouchure, Toulouse, France.

March 30, 1927

265,171* Pneumatic tire puncture indicator. H. Jacoby, Eberstadt, near Darmstadt, Germany.

265,303 Road surface signs. C. A. Richardson, Exchange Buildings, Queen street, Newcastle-on-Tyne.

265,419 Springs. Spencer, Moulton & Co., Ltd., and C. W. C. Hine, 2, Central Buildings, Westminster.

265,452 Elastic balloons for raising sinking ships. R. Marcks, 86 Schliessfach, Berlin, Germany.

265,479 Hydro therapeutic appliances. E. Havard, 56 Avenue Victor Hugo, Paris, France.

265,516 Baby's creeping garment. A. F. Jagoe, Ridgefield Park, New Jersey, U. S. A.

265,565 Dental suction appliances. K. Heitmüller, Theaterplatz, Gottingen, Germany.

* Not yet accepted.

New Zealand

February 10, 1927

57,136 Tire. Hibbert Pneumatic Cell Tire Co., Ltd., 227 Auburn street, Goulburn, N. S. W., Australia.

57,550 Vehicle tire. William Douglas Bauld, Eastern Market Buildings, Bourke street, Melbourne, Victoria, Australia, assignee of Frederick Lionel Rapson, Ottershaw Park, Chertsey, England.

57,791 Puncture sealing composition. Arthur Walter Dickeson, 95 Auburn Road, Auburn, Victoria, Australia.

February 24, 1927

57,228 Detachable heel. Colin Thompson Arbuthnot Shearer, Greenwalk Cottage, Milton Abbey, Blandford, Dorsetshire, England.

57,876 Seat surface. Harold Arthur Howard, 9 Voss Court, Streatham, London, S. W. 16, England.

Chemical patents will be found on page 81. Machinery and Process Patents on pages 85-86.

Germany

442,058 Inflatable hollow rubber body. Siegfried Saul, Dahmengraben 10, Aachen.

442,061 Rolls consisting of inflated rubber balls, for roller skates. Dr. Otto von Rottenburg, Berlin-Dahlem.

442,070 Rubber heel. United Shoe Machinery Corp., Paterson and Boston, U. S. A. Represented by K. Hallbauer and A. Bohr, Berlin S. W. 61.

442,143 Sponge rubber head rest for bath tubs. Ernst Seckbach, Gartenstrasse 9, Görlitz.

442,234 Rubber tube for emptying liquids and gases out of hollow bodies. Dr. Jacob Clemens, Grevenbroich.

Trade Marks

United States

Two Kinds of Trade Marks Now Being Registered

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section (1) (b), are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the later act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

March 15, 1927, Act of February 20, 1905

225,140 Representation of a heart—golf balls and clubs. The Burke Golf Co., Newark, Ohio.

225,173 U. S. M. C.—heels. United Shoe Machinery Corporation. Paterson, New Jersey, and Boston, Massachusetts.

225,203 TEPSON—raincoats, etc. S. Tepfer & Sons, New York, N. Y.

March 15, 1927, Act of March 19, 1920

225,436 JANE MONROE—shoes of leather, rubber, fabric, etc. The Harper & Kirschten Shoe Co., Chicago, Illinois.

225,439 "HEALTH AND WEAR IN EVERY PAIR"—baby pants. Red Raven Rubber Co., Newark, New Jersey.

225,444 LENOX—boots, shoes, overshoes, etc. Hood Rubber Co., Watertown, Massachusetts.

225,445 LUZON—boots, shoes, overshoes, etc. Hood Rubber Co., Watertown, Massachusetts.

March 22, 1927, Act of February 20, 1905

225,494 RAINY DAYSEE—caps to protect hats from rain. Evernu Rubber Heel Corporation, New York, N. Y.

225,504 Representation of a tire through the center of which is protruding the head of a pig, at the side of the representation are the words: WEAR LIKE A PIG'S NOSE—tires and tubes. The U. S. Farm Sales Co., Salina, Kansas.

225,517 ZIPPS—sport shoes. The B. F. Goodrich Co., New York, N. Y.

225,539 Square containing the representation of a foot and the words: THE ARCH RISER—shoes. Kuiz & Lapidus, Inc., Brooklyn, New York.

225,639 FARA-WEAR—rubberized fabric gloves. The Master Cord Belt Co., Denver, Colorado.

225,664 BADGER—belts and belting. The Badger Rubber Works, Milwaukee and Cudahy, Wisconsin.

225,665 Geometrical design—pneumatic tire casings. The Badger Rubber Works, Milwaukee and Cudahy, Wisconsin.

225,666 TRINITY—tires and tubes. The Badger Rubber Works, Milwaukee and Cudahy, Wisconsin.

225,674 BADGER—belts, belting and transmission disks. The Badger Rubber Works, Milwaukee and Cudahy, Wisconsin.

225,697 Circle through the center of which are two horizontal lines enclosing the word: POM-ROY—bags. Max Pomeranz, doing business as Royal Specialty Hat & Bag Co., New York, N. Y.

225,703 Square containing the words: CLARK'S DOLLAR $1. STORE—dress shields, hard rubber combs, etc. Albert J. Clark, doing business as Clark's Dollar Stores, Los Angeles, California.

225,725 Representation of a house, above which are the words: CHARTER-HOUSE—boots and shoes, etc. Union Clothing Co., Rochester, New York.

225,728 Fancy circle enclosing the word: PARAVITAE—narrow elastic tape. Southern Webbing Mills, Inc., Greensboro, North Carolina.

225,731 Octagon containing the words: BROOKLYN MAID—shoes. Nu-Way Shoe Co., New York, N. Y.

225,739 MILWAVE—mackintoshes, waterproof coats, capes, etc. H. E. Mills, Ltd., London, England.

225,761 Signature: "WM. M. SCHOLL M. D."—boots, shoes and slippers. The Scholl Manufacturing Co., Inc., Chicago, Illinois.

225,770 Representation of an animal, beneath which is a pennant bearing the word: DERMATINE—nonmetallic articles. Dermatine Co., Ltd., London, England.

March 22, 1927, Act of March 19, 1920

225,809 NARRO REST HEEL—shoes. Kurz & Lapidus, Inc., Brooklyn, New York.

March 29, 1927, Act of February 20, 1905

225,872 Representation of a tire lying on the ground and crouching over it the representation of a badger—tires, casings, sleeves and inner tubes. The Badger Rubber Works, Milwaukee and Cudahy, Wisconsin.

225,901 Representation of a blue bird, at the top of the representation the word: BLUE; beneath the representation the word: BIRD—tube repair kits for pneumatic tires. Brooker-Davis Paper Co., Columbia, South Carolina.

225,904 The words: RED KING, shaded to indicate red—tube patches. Herbert A. Heitman, Houston, Texas.

225,909 BADGER—cements. The Badger Rubber Works, Milwaukee and Cudahy, Wisconsin.

225,929 MOHAWK—tires, inner tubes, patches, etc. The Mohawk Rubber Co., Akron, Ohio.

225,940 HEALTH-WAY—surgical corsets, abdominal supports, elastic stockings, etc. William S. Rice, Inc., Adams and Buffalo, New York.

225,965 Circle containing the words: HEAVY BALLOON TOURIST—tires and tubes. The Goodyear Tire & Rubber Co., Akron, Ohio.

225,978 Representation of a dog—erasers, etc. Reeves & Sons, Ltd., London, England.

226,000 Section of a cushion tire containing the word: NAP—pneumatic tires. The Nap Pneumatic Tyre Co., London, England.

226,038 BADGER—tires, casing tubes, hose and belts. The Badger Rubber Works, Milwaukee and Cudahy, Wisconsin.

226,055 MARATHON—shoes and heels. Marathon Rubber Co., Inc., Akron, Ohio.

226,078 THERMLO—accelerators. The Roessler & Hasslacher Chemical Co., New York, N. Y.

March 29, 1927, Act of March 19, 1920

226,134 EVER READY—sanitary belts, etc. Ever Ready Rubber Products Corporation, San Francisco, California.

226,151 BRIGHTON—laminated rubber compositions for outsoles and top lifts for shoe repairs. Morris Feldstein & Son, New York, N. Y.

April 5, 1927, Act of February 20, 1905

226,184 GOOD WILL—garters, etc. Korn Brothers, New York, N. Y.

226,269 Representation of a king—gloves. King Glove Co., Los Angeles, California.

226,275 GLAZETTE—rubber fabric in the piece. Archer Rubber Co., Milford, Massachusetts.

226,287 Heptagon containing the words: PREMIER BALLOON CORD—tires. The Fisk Rubber Co., Chicopee Falls, Massachusetts, and Cudahy, Wisconsin.

226,306 Wreath at the top of which is the representation of a crown, and in the center the word: CORINNE—shoes, gloves, etc. Stix, Baer & Fuller Co., St. Louis, Missouri.

226,307 "TRUDY"—bathing caps. The Seamless Rubber Co., Inc., New Haven, Connecticut.

226,345 Representation of a leaf superimposed upon which are the words: THE GREENLEAF SHOP GREENTREE'S—raincoats, shoes, etc. Meyer Greentree, Richmond, Virginia.

226,401 TABOR HALL—raincoats, etc. Henry Sonneborn, Co., Inc., Baltimore, Maryland.

226,410 RUBGRIP—road making material. Universal Rubber Paviors (Manchester 1923) Ltd., Audenshaw, near Manchester, England.

April 5, 1927, Act of March 19, 1920

226,430 HEAT PROOF—inner tubes for pneumatic tires. The India Tire & Rubber Co., Mogadore and Akron, Ohio.

226,437 ELMSFORD—raincoats. Shedrain Coat Co., Inc., New York, N. Y.

Dominion of Canada

Registered

March 15, 1927

41,268 An ellipse, with the words: "CONSTANT AW COMFORT," inserted therein, and also the words: "STEEL ARCH SUPPORT" underneath—boots and shoes. The Ault-Williamson Shoe Co., Auburn, Maine, U. S. A.

41,274 Word: "TRIPLEXD," on a raised bar or platform—fabric covered rubber hose. Metal Hose & Tubing Co., Brooklyn, New York, U. S. A.

41,289 Word: "WHIZ" in white letters above a triangular device having rounded corners, the inner part of the triangle being yellow with an outer band of red, the whole appearing on a blue background having a band of red at its upper and lower edges; the name of the product to which the mark is applied is to be shown in the triangle—repairing outfit, paints, etc. The R. M. Hollingshead Co. of Canada, Ltd., Bowmanville, Ontario.

41,292 Word: "GOLD SEAL"—garters, armlets, fancy shirred elastic, etc. Gault Brothers, Ltd., Vancouver, British Columbia.

April 5, 1927

41,339 Representation of a griffin holding a shield bearing the letters: "H G K Co" in monogram form, the griffin being seated on a low platform on which is arranged a band bearing the inscription "SEMPER SURSUM"—goods manufactured from rubber. Dr. Heinr. Traun & Sohne, Vormals Harburger Gummi-Kamm-Compagnie, 59 Meyerstrasse, Hamburg, Germany.

United Kingdom

March 2, 1927

476,410 "HERIC"—toe tips. The Heckmondwike Rubber Co., Ltd., Walkley Lane, Heckmondwike.

476,545 FRIOT—elastic webs and cords. Müller & Hussels, Wichlinghauser Strasse, 47 Barmen, Germany.

March 9, 1927

466,055 KOLKUT—tubular hose. Elizabeth Holroyd, 27, Bridge street, Manchester.

473,491 The words: "MIOM GALLIA" enclosed in a fancy design—caoutchouc in plate, strip and molded form. Compagnie Générale D'Électricité, 54 Rue La Boetie, Paris, France.

476,250 DELANEIGE—boots, shoes, slippers, leggings and gaiters. The Dela Rubber Shoe Co., Ltd., 2, Cambridge street, Manchester.

476,475 MACATOSH—goods manufactured from rubber and gutta percha. Charles Macintosh & Co., Ltd., 2, Cambridge street, Manchester.

477,261 TRICOSYL—gaiters. The Resiflex Gaiter Manufacturing Co., Ltd., 36 Featherstone street, City Road, London, E. C. 1.

March 16, 1927

476,764 MOTOS—partly prepared and reclaimed rubber. Northwestern Rubber Co., Canal Works, Hawthorne Road, Litherland, Liverpool; and Second National Building, Akron, Ohio, U. S. A.

476,782 BELFLOR—floor tiles. Bell's Poilite & Everite Co., Ltd., Asbestos House, Southwark street, London, S. E. 1.

477,198 AQUAGRAM—all goods included in Class 11. W. G. Ingram, Gramwill Works, 161, Parnell Road, Old Ford, London, E. 3.

March 23, 1927

477,163 ANCOFOR—goods manufactured from rubber and gutta percha. Herbert Temple, 145, Cheapside, London, E. C. 2.

477,188 FROTHFLOWER—goods manufactured from rubber and gutta percha. Herbert Temple, 145, Cheapside, London, E. C. 2.

477,508 ORTEX—sanitary aprons, etc. Naamlooze Vennootschap Orveltee Textiel Industrie, 98 Heerengracht, Amsterdam, Holland.

March 30, 1927

B473,203 PATCHQUICK—patching materials. Patchquicks Patent, Ltd., Tiverton, Devonshire.

477,062 AMPAR—raw or partly prepared rubber, Continental Rubber Co. of New York, New York, N. Y., U. S. A.

477,257 SOTONITE—rubber covered copper wire. Pirelli General Cable Works, Ltd., 144, Queen Victoria street, London, E. C. 4.

477,832 OCCULTABA—surgical and elastic stockings. Ernest Rat, 12 Quai St. Antoine, Lyons, France.

Designs

United States

72,208 Shoe sole. Term 7 years. James E. Grosjean, Lima, Ohio.

72,217. Tire. Term 14 years. Andre Jules Michelin, Paris, France.

72,218 Tire. Term 14 years. Andre Jules Michelin, Paris, France.

72,240 Tire. Term 14 years. Edward M. Sears, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

72,241 Tire. Term 14 years. Edward M. Sears, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

72,263 Tire. Term 7 years. Ralph W. Hutchens, assignor to Gillette Rubber Co., both of Eau Claire, Wisconsin.

72,274 Tire. Term 3½ years. James Reeves Nevius, assignor to The de Laski & Thropp Circular Woven Tire Co., both of Trenton, New Jersey.

72,315 Thermometer case. Term 14 years. Isaac Gurnee, Butler, and Albert A. Smith, Riverdale, assignors to Superior Hard Rubber Co., Butler, all in New Jersey.

72,381 Toy balloon. Term 3½ years. James F. Mulholland, Columbus, Ohio.

72,382 Tire. Term 7 years. Philip H. Ober, assignor to The Mansfield Tire & Rubber Co., both of Mansfield, Ohio.

Dominion of Canada

7,480 Tire tread. The Bawden Machine Co., Ltd., Toronto, Ontario.

7,481 Tire tread. The Bawden Machine Co., Ltd., Toronto, Ontario.

Germany

978,942 Rubber coat with detachable wool lining. Wilhelm Haug, Spitalerstrasse 12, Hamburg.

979,005 Knee protector of rubber. Heinrich Burgard, Burgsteinfurt i. W.

979,171 Rubber ring for radio phones and the like. Gottlieb Bader, Oberprechtal, Amt Waldkirch i. B.

979,706 Rubber for chair legs. Theodor Renz, Viernheim, Hessen-Darmstadt.

980,168 Hot water massaging apparatus with or without rubber cuff. Wilhelm Hoffmann, Potsdamerstrasse 30, Berlin-Südende.

980,170 Infant's feeding bottle with rubber nipple. Franz Sengbusch, Jagowstrasse 2, Spandau.

980,301 Gas filled rubber ball. Dunlop Rubber Co., Ltd., London. Represented by Dr. R. Wirth, C. Weihe, Dr. H. Weil, M. Wirth, of Frankfurt-am-Main and T. R. Koehnhorn and E. Noll, Berlin, S. W. 11.

980,331 Inhaling apparatus. Dr. Moritz Bauer, Vienna. Represented by Eugen v. Eckert, Friedrich-Wilhelmstrasse 5, Berlin.

980,871 Resilient perch for bird cages of wood, hard rubber or the like. Sauer & Polster, Chemnitz.

981,032 Gas tube of zinc-coated steel covered with rubber thread. Rheinische Gummi-und Asbest-Gesellschaft Schreven & Riedl, Duisburg.

981,078 Rubber sole. Karl Hartsch, Reichertstrasse 19, Gorlitz.

981,181 Non-rolling rubber ball for medical and industrial purposes. Dr. Wilhelm Müller, Eibenstock i. Erzgeb.

981,185 Rubber bed-pan. Mannheimer Gummistoff-Fabrik Rode & Schwalenberg, G. m. b. H., Mannheim.

981,341 Rubberized fabric tie. Kurt Hübel, Bismarckstrasse 12, Magdeburg.

981,490 Protective body covering of shaped rubber knitted goods. (knee-caps, abdominal binders and the like). Hermann Oberländer, Zeulenroda.

981,518 Safety feeding bottle with nipple. Alois Sikora, Kieferstadlerstrasse, Gleiwitz and Gerhard Plesch, Gr. Blottnitzastrasse 12a, Beuthen, O. S.

981,769 Rubber foot mat. Barmer Gummifabrik, G. m. b. H., Barmen-Rittershausen.

982,039 Rubber cover. Robher Cramer, Beuststrasse 45, Essen.

982,293 Rubber handle. Michael Thonnett, Ankerstrasse 25, Cologne.

982,381 Valve for toilet reservoir with hanging rubber ball. Georg Vollmer, Raboisen 58, Hamburg.

Labels

United States

31,803 WHITE MULE. Tire patches. White Mule, Inc., Carbondale, Illinois. Published March, 1924.

Prints

United States

9,685 SANTRO BLACK BAND NIPPLES. Nipples. Julius Schmid, Inc. New York, N. Y. Published September 10, 1926.

9,711 ARISTOCRAT OF TIREDOM. Tires. Vogue Rubber Co., Chicago, Illinois. Published January 3, 1927.

Legal Decisions

Customs Appraisers' Decisions

No. 1570. Protest 142926-G of Pittsburgh Ortheopedic Co., Philadelphia. Merchandise returned by the appraiser and collector as knitted knee caps, composed of cotton and rubber, cotton chief value, was classified at 40 per cent ad valorem under paragraph 921, tariff act of 1922, as cotton articles, and is claimed dutiable at 35 per cent under paragraph 913 providing for fabrics with fast edges not exceeding 12 inches in width, and articles made therefrom. The protest was overruled. Abstracts 46,111 and 47,445 noted.—*Treasury Decisions,* Volume 51, No. 2, p. 26.

No. 1614. Protest 99498-G of Kaufman Dept. Stores, Pittsburgh. Rubber bath mats classified as floor coverings at 40 per cent ad valorem under paragraph 1022, tariff act of 1922, are claimed dutiable as manufactures of rubber at 25 per cent under paragraph 1439. It was held that the provision for floor coverings in paragraph 1022 is more specific than the provision for manufactures of rubber under paragraph 1439. G. A. 8690 (T. D. 39816), United States v. Boker (6 Ct. Cust. Appls, 243; T. D. 35472), and Magone v. Heller (150 U. S. 70) cited. The protest was therefore overruled.—*Treasury Decisions,* Volume 51, No. 2, p. 34.

Disclaimer

No. 1,149,580, Fritz Hofmann, Elberfeld, and Kurt Gottlob, Vohwinkel (near Elberfeld), Germany. Caoutchouc substance and vulcanization product thereof, patent dated August 10, 1915. Disclaimer filed February 11, 1927, by the assignee. The Grasselli Chemical Co.

Hereby enters this disclaimer and disclaims:

(a) From the scope of said claims 1 and 4 of said letters patent, in the process of producing vulcanized rubber and the new article of manufacture, vulcanized rubber, therein set forth, the use of ammonia, dimenthylamin, and diethylamin, which are substances set forth in U. S. Patents 1,081,613 and 1,081,614 referred to in lines 11 to 17 of page 1 of the specification of said Patent 1,149,580.

(b) From the scope of said claims 1 and 4 of said letters patent, in the process of producing vulcanized rubber and the new article of manufacture, vulcanized rubber, therein set forth, the use of methylene bases as set forth in U. S. Patent 1,126,469, issued on application Serial No. 795,505, and U. S. Patent 1,130,-903, issued on application Serial No. 795,506, which are the applications referred to in lines 18 to 25 of page 1 of the specification of said Patent 1,149,580, and the use of para-amino-dimenthylanilin as a member of the group of substances so described as methylene bases in said Patents 1,126,149 and 1,130,903 and the applications therefor.

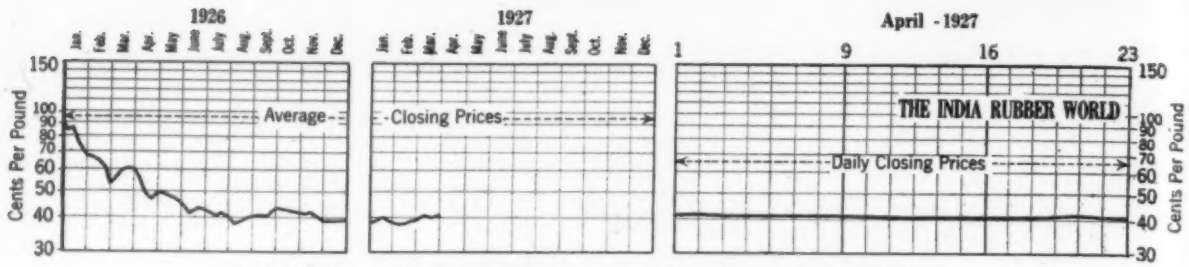
(c) The word "naphthylamin" in lines 35 and 36 of page 1 of the specification of said letters patent 1,149,580, which should have read "naphthylenediamin."—*Official Gazette,* Volume 356, p. 1.

Trade Marks

Appeal of the Rubber & Celluloid Products Co., opposer, of the decision of the examiner of trade mark interferences granting the motion to dismiss opposition No. 7,349 to registration of "Rub-R-Tite" for brushes, the opposer alleging ownership of the notation "Rubberset" for the same class of goods. The decision of the examiner of trade mark interferences granting the motion to dismiss the opposition and adjudging the applicant entitled to the registration for which it has applied, is affirmed.—Rubber & Celluloid Products Co. v. Star Brush Manufacturing Co., Inc.; Decision, Commissioner of Patents, March 2, 1927.

Ex Parte Dunlop Tire & Rubber Corp. of America. Application for registration of trade mark for golf ball filed August 5, 1925, Serial No. 218,396.

Appeal from the decision of the Examiner of trade marks denying registration of a certain design impressed over the entire surface of a golf ball as a trade mark. The Examiner holds that the design is continuous over the entire surface of the goods and is a part and a functional feature of the golf ball itself. The decision of the Examiner is affirmed.—*Official Gazette,* Volume 355, p. 677.



Ratio Graph of New York Closing Prices of Spot Ribbed Smoked Sheets

Review of the Crude Rubber Market

New York Outside Market

THE crude rubber market for April was very much in contrast to that for March. The latter was strong and active with prices steadily advancing because of spring revival of tire manufacturing activity. This activity continues unabated but was without effect upon the local crude rubber market which exhibited in succession four weeks of subnormal activity approaching stagnation. Recovery from this condition is considered probable shortly after the further restriction of 10 per cent in the exportable allowance which is a foregone conclusion for the quarter beginning May 1. From that date to August 1 shipments of plantation rubber from British controlled areas will be 60 per cent of standard production. This is estimated to be about 250,000 tons. Revision of standard production has been completed only for Ceylon which is now rated at 71,000 tons annual production. That for Malaya is yet to be announced.

Higher prices have prevailed for several weeks in the primary markets over those in New York. The bulk of the tonnage for American consumption being purchased in the Far Eastern primary markets militates against the dealings here, confining them to the narrow limitations of spot and nearby and lesser tonnages. The steadiness with which spot prices were maintained during April is notable. As exhibited in the chart above the record shows as a straight line practically without deviation at the 41 cent level.

In the week ended March 26 the market was firm and steady. However, there was little business doing other than scattered trades. The far eastern markets were firm and higher than that in New York. On Thursday the market here sold off on liquidation in London. It became steady on Friday with active dealer trading on the Rubber Exchange.

During the week ended April 2 business was very dull. Price fluctuations were very narrow. Factory interest was limited resulting only in some scattered buying of nearby rubber. London and Singapore markets were very steady with prices ruling slightly above those in New York which limited interest at this point.

The market of the week ended April 9 presented no essential variation from that of the preceding week as regards trading, factory interest and the relative price levels of the foreign and domestic markets.

The week closing April 16 showed no enlivening of market interest due in part to the approach of two holidays at the close of the week anticipating Easter. Factory inquiry was limited strictly to spot and apparently the probability of 10 per cent further restriction due May 1 was discounted.

The market for the week ended April 23 was practically stagnant. Factory interest virtually disappeared and no buying was in evidence. Prices held steady both here and abroad.

Paras throughout the month evinced the same lack of interest as the plantation grades although supplies were available. Balatas declined to the lowest point reached in a long period past but were without interest.

Importations of all grades in March were 35,078 tons, compared with 42,677 tons one year ago. Plantation arrivals for March were 33,114 tons compared with 40,177 tons one year ago. Total importations of plantation rubber for three months ended March 31 were 101,086 tons, compared with 108,381 tons for the corresponding period of 1926. Total importations of all grades of rubber for the three months ended March 31 were 108,637 tons compared with 115,441 tons for the corresponding period of 1926. Arrivals of crude rubber April 1 to 23 were 32,100 tons. Arrivals for the full month are estimated at 41,000 tons, compared with 36,456 tons for March.

RUBBER AFLOAT TO THE UNITED STATES

(Figures in Long Tons)

Week Ended	British Malaya	Ceylon	East Indies	London and Liverpool	Totals
March 26	5,800	1,014	1,638	493	8,945
April 2	4,936	582	1,568	542	7,628
April 9	5,536	584	805	1,295	8,220
April 16	3,875	1,037	1,513	624	7,049
April 23	5,548	199	1,241	475	7,463

New York Outside Market—Spot Closing Rubber Prices—Cents Per Pound

PLANTATIONS	March, 1927				April, 1927																		
Sheet	28	29	30	31	1	2	4	5	6	7	8	9	11	12	13	14	*15	*16	18	19	20	21	22	23
Ribbed smoked	41⅜	41½	41½	41¼	41¼	41⅜	41¼	41¼	41¼	41¼	41¼	41¼	41½	40⅞	40⅝	40¾	....	....	40¾	40¾	40⅞	41⅛	40⅞	40⅞
Crepe																								
First latex	41⅞	41½	41⅜	41½	41½	41½	41½	41½	41½	41½	41½	41½	41½	41¼	40⅞	40⅞	....	....	40⅞	41⅜	41¼	41⅜	41⅛	41⅛
No. 2 blanket	39¼	39	39	39	39	39⅛	39	39	39	39	39	39	38⅞	38¾	38¾	38¼	....	....	38¼	38½	38⅜	38⅝	38½	38¾
No. 3 blanket	38⅜	38⅜	38½	38½	38½	38¾	38⅝	38½	38½	38⅝	38⅜	38½	38¼	37⅞	37⅞	37¾	....	....	37¾	37⅞	38	38¼	38⅛	38¼
No. 4 blanket	37½	37⅜	37½	37½	37½	37½	37½	37½	37⅜	37½	37⅜	37¼	37¼	37½	37⅜	37⅜	....	....	37⅜	37½	37	37⅝	37½	37¼
Thin clean brown	38¼	38⅜	38½	38½	38½	38⅝	38⅝	38⅝	38⅝	38⅝	38⅝	38⅝	38¼	38	37⅞	37¾	....	....	37¾	38	38½	38¼	38⅛	38⅛
Rolled brown	35	35¼	35¼	35¼	35¼	35⅛	35	35⅛	35⅛	35⅛	35¼	35¼	35⅜	35⅛	35⅜	35⅛	....	....	35¾	35¼	35¼	35⅜	35¼	35¼
Off latex	41¼	41	40¾	40⅞	40⅞	41	41⅛	40⅞	41	41	41	41	41⅛	40¾	40⅜	40⅜	....	....	40¾	40⅞	40⅞	40¾	40¾	40¾

*Holiday.

New York Quotations

Following are the New York spot and future rubber quotations for one year ago, one month ago and April 25, the current date:

	April 26, 1926	March 26, 1927	April 25, 1927
Plantation Hevea			
Rubber latex (Hevea)...*gal.*	$2.00 @	$1.50 @	$1.50 @
CREPE			
First latex crepe, spot	.48 @.48½	.41¼@	.41¼@.41½
April	.48¼@	.41¼@	.41¼@.41½
May-June	.47 @.48	.42¼@	.41 @.41¼
July-September	.46½@.47	.43 @.43¼	.42 @.42¼
October-December	.45 @.45½	.44 @	@
Off latex, spot	.47½@	.41¼@.41½	@
Amber No. 2, spot	.44½@.45	.39 @	.38½@.38¼
April	.44 @.44½	.39 @	.38½@.38¼
May-June	.43¼@.43½	.39¼@	.38¼@.39
July-September	.43 @.43½	@	.39¼@.39½
Amber No. 3, spot	.44 @.45	.39 @	.38¼@
Brown, thin, clean	.44 @	.39 @	.38 @
Brown, specky	.43 @	.38 @	.37 @
Brown, roll	.40 @	.35 @	.35½@
Sole crepe	.80 @	@	@
Sheet			
Ribbed, smoked, spot	.48 @.48½	.41½@.41¾	.41 @.41¼
April	.48½@	.41½@.41¾	.41 @.41¼
May-June	.47½@.47¾	.42 @.42½	.41¼@.41½
July-September	.46½@.46¾	.42¾@.43	.41¾@.42
October-December	.44½@.45	.44 @	.42½ .42¾
East Indian			
PONTIANAK			
Banjermassin	@	.10 @	.09 @.10
Pressed block	@	.15 @	.16 @.17
Sarawak	@	.10 @	.10 @
South American			
PARAS			
Upriver, fine	.42½@.43	.33½@	.33 @
Upriver, fine	@	*.44 @	*.43½@
Upriver, medium	.37 @	.29 @	.29 @
Upriver, coarse	.30 @.30½	.25 @	.24½@
Upriver, coarse	@	*.38 @	*.38½@
Islands, fine	.36½@.37	.30 @	†.31 @
Islands, fine	@	*.43 @	*.42 @
Acre, Bolivian, fine	.44 @	.44½@	.33½@
Acre, Bolivian, fine	@	*.44½@	*.44 @
Beni, Bolivian	.45 @	.45 @	.34 @
Madeira, fine	.45½@	.44 @	.33½@
Peruvian, fine	.43 @	.43 @	.32 @
Tapajos, fine	.41 @	.41 @	.32 @
CAUCHO			
Upper Caucho ball	.29½@.30	.28 @	.26 @
Upper Caucho ball	@	*.39 @	*.38½@
Lower Caucho ball	.22½@.23	.25 @	.24½@
Maniçobas			
Ceará negro heads	.40 @	@	.24 @
Ceará scrap	.20 @	@	.12 @
Maniçoba, 30% guarantee	.37 @	@	.22 @
Mangabiera, thin sheet	.40 @	@	.24 @
Centrals			
Central scrap	†.32 @	@	.25 @
Central wet sheet	†.24 @	@	.17 @
Corinto scrap	†.29 @	@	.25 @
Esmeralda sausage	†.32 @	@	.25 @
Guayule			
Duro, washed and dried	@	.33 @	.33 @
Gutta Percha			
Gutta Siak	@	.23 @	.21½@.22
Gutta Soh	@	.45 @	.38 @.40
Red Macassar	@	3.00 @	3.00 @
Balata			
Block, Ciudad Bolivar	@	.37 @	.37 @.38
Colombia	@	.37 @	.35 @.36
Manaos block	@	.40 @	.42 @
Panama	@	@	@
Surinam, sheet	@	.66 @	.62 @
amber	@	.70 @	.66 @
Chicle			
Honduras	‡.64 @	‡.56 @	‡.65 @
Yucatan, fine	‡.65 @	‡.56 @	‡.65 @

*Washed and dried crepe. Shipment from Brazil.
†Nominal. ‡Duty paid.

Low and High New York Spot Prices

Plantations	1927*	April 1926	1925
First latex crepe	$0.40¼@$0.41¼	$0.47½@$0.60	$0.41¼@$0.45¼
Smoked sheet, ribbed	.40¾@ .41½	.46½@ .59½	.41¼@ .44¾
Paras			
Upriver, fine	.32 @ .33½	.41 @ .53½	.36 @ .37½
Upriver, coarse	.23¼@ .26¼	.30 @ .38	.29¼@ .30¾
Islands, fine	.27 @ .29¼	.35 @ .48	.32½@ .33
Cameta		.25 @ .34	.17½@ .18

*Figured to April 23, 1927.

London

Very similar conditions prevailed on the London market during April as existed in New York. Each succeeding week from March 28 to April 23 comprised a series of sessions marked by prices which were steady as a rule with minor fluctuations, spot sellers' prices on April 23 being reported at 20⅛ pence ⅛ down from that on March 28. The Easter holidays accounted for a brief period of absolute inactivity but their occurrence was negligible in the uneventful course of the market for the month.

London stocks increased weekly from March 26 to April 23. The gain between those dates was 2,344 tons. This advance, however, seemed not to have depressed the market. The weekly record is as follows: March 26, 63,167 tons; April 2, 62,634 tons; April 9, 64,861 tons; April 16, 65,033 tons; April 23, 65,511 tons.

Singapore

Standard plantation rubber grades ruled very steady and quiet during April, following the consuming markets closely. The auctions there were generally well supported. The following Singapore opinion on the crude rubber situation as reported by Consul General Addison E. Southard is of interest.

Local producers of rubber have been certain that American consumers would have to buy actively enough during the quarter just closed to maintain a 21 pence price and thus avoid the cut to 60 per cent of standard production. There has been no doubt in the minds of the majority of producers that if the cut did materialize there would be an immediate upward movement in prices, particularly with the adverse conditions brought about by the floods. The failure of American buyers to support prices has completely puzzled the Malayan grower and broker. Many brokers, especially Chinese, have been so confident of a rising market that they speculated heavily in "forwards." There are many well informed persons in Singapore who believe that failure to achieve an appreciable rise in the price of rubber before next October 31st might result in modification of the provisions of the Stevenson scheme. There is little belief that prices can go appreciably under current figures, at which plantations do very well indeed. Intensive publicity has convinced Malayan growers that they have a world monopoly on rubber which cannot be broken before about 1933, and that consumption demands must soon exceed possible production, and naturally they do not find it easy to reconcile themselves to only reasonable profits. There has been remarkably little comment on, or notice taken of, the American buying pool reported from New York some weeks ago. It has been suggested that Malayan rubber interests fail to take cognizance of possible stocks in the United States, basing their stock calculations almost entirely on the London situation. British producers are also thought to discredit the extent to which reclaimed rubber is being used in America, saying that if it were used in American tires they would not (as they do in Singapore) give good service.

British Malaya

RUBBER EXPORTS

An official cablegram from Singapore to the Malay States Information Agency, 88 Cannon street, London, E. C. 4, England, states that the amount of rubber exported from British Malaya during the month of March last totaled 41,346 tons. The amount of rubber imported was 17,462 tons, of which 14,024 tons were declared as wet rubber. The following are comparative statistics:

	1926		1927	
	Gross Exports Tons	Foreign Imports Tons	Gross Exports Tons	Foreign Imports Tons
January	30,452	10,237	34,946	14,995
February	30,440	8,306	27,528	11,697
March	35,012	14,800	41,346	17,462
Totals	95,904	33,343	103,820	44,154

Note—The above figures represent the totals compiled from declarations received up to the last day of the month for exports from and imports to all ports of British Malaya and not necessarily the actual quantity shipped or landed during that month.

DISTRIBUTION

The following is a comparative return of distribution of shipments during the months of February and March, 1927:

	February 1927 Tons	March 1927 Tons
United Kingdom	7,224	9,566
United States of America	16,672	26,126
Continent of Europe	1,839	2,231
British Possessions	502	718
Japan	1,285	2,682
Other foreign countries	6	23
	27,528	41,346

The Rubber Exchange of New York, Inc.

Trading on the Rubber Exchange from March 28 to April 23 inclusive resulted in the sale of 2,424 contracts, equivalent to 6,060 long tons, as compared to 6,054 contracts and 15,135 tons the previous month. American rubber consumption in April is estimated at 36,000 tons. This is the same as the record for March and the continuance of tire and tube production at full spring schedules.

During April the market for futures was exceedingly dull week by week and just before the Easter holidays became practically stagnant. The chart of high and low prices of futures from April, 1927 to March, 1928, shows much narrowed fluctuations than usual for all positions. The spread between lowest and highest for these 12 monthly futures is 3.6 cents.

F. R. Henderson of Henderson, Helm & Co., Inc., and president of the Rubber Exchange, summarizes the current crude rubber situation as follows:

Prices have yielded more to pressure on the part of sellers than to any inherent weakness. The volume of business has been exceedingly light, and perhaps this is because we are in what might be termed an "in between" position. Tire manufacturers are naturally awaiting the progress of spring business; holders of rubber are not anxious sellers with the approach of the new quarter in the restriction year with its price possibilities.

Another 10 per cent export cut from the restricted area is now inevitable reducing the exportable allowance to 60 per cent of standard May 1.

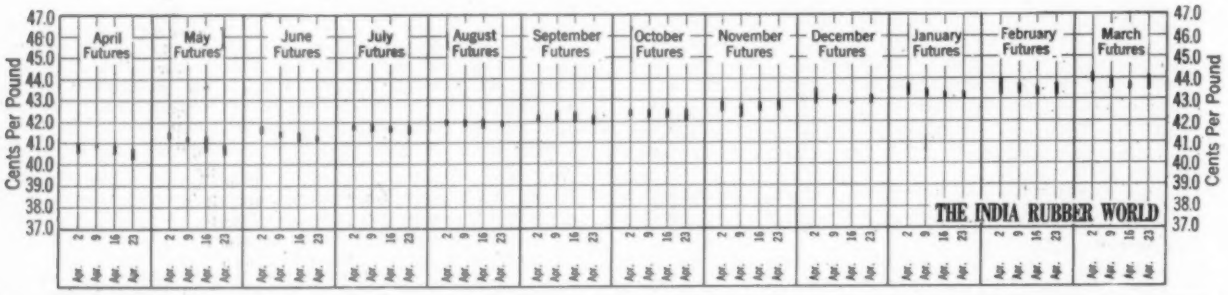
From the present statistical position we believe all of the unused coupons will have been used by the end of April, as far as British Malaya is concerned. There should be about 9,000 tons carryover in Ceylon.

The outstanding features of the situation are as follows: Shipments from the restricted area in British Malaya for the second half of the restriction year will be 40,000 tons less than during the first half. World stocks are now about 245,000 tons. Total average shipments per month for the balance of the year (plantation and wild) from all points, about 44,200 tons. Average consumption per month, all countries, 48,500 tons. The world stock is not as formidable as the figure indicates. The bulk of rubber is produced in the opposite side of the world from the point of consumption, so that the amount of rubber in transit should not be considered as stock, because it must always be moving.

The same may be said of the stock in Singapore, which is really in preparation for shipment. If we use the stock of rubber on hand in America and Europe, it is probably nearer to what might be termed stock, from the standpoint of market influence. This figure is approximately 160,000 tons, or sufficient for the world's requirements for three months.

Taking into consideration the prevailing rubber prices; the unusual smallness of forward contracts at this season of the year; the improving conditions in Europe; the unquestioned soundness of conditions in this country; we find nothing to alter our opinion that prices will improve as we enter the months where consumption will exceed shipments from primary markets.

New York Rubber Exchange—High and Low Monthly Futures — Cents Per Pound



The Rubber Exchange of New York, Inc.

Daily Market Futures—Ribbed Smoked Sheets—Closing Prices—Cents Per Pound

1927	March 28	29	30	31	April 1	2	4	5	6	7	8	9	11	12	13	14	15*	16*	18	19	20	21	22	23
April	40.8	40.8	41.0	40.9	40.6	41.0	40.8	40.8	40.8	40.9	40.9	40.8	40.9	40.7	40.5	40.5	...	...	40.5	40.3	40.7	40.7	40.7	40.6
May	41.4	41.4	41.5	41.4	41.2	41.5	41.3	41.1	41.3	41.3	41.3	41.2	41.3	40.8	40.6	40.7	...	...	40.7	40.5	40.8	40.9	40.7	40.6
June	41.6	41.5	41.7	41.7	41.5	41.8	41.4	41.4	41.4	41.6	41.6	41.5	41.5	41.3	41.1	41.2	...	...	41.2	41.0	41.3	41.5	41.3	41.1
July	41.8	41.7	41.8	41.8	41.8	41.9	41.7	41.6	41.8	41.8	41.9	41.8	41.8	41.5	41.5	41.6	...	...	41.6	41.4	41.7	41.8	41.6	41.6
August	42.0	41.9	42.0	42.0	42.0	42.1	41.9	41.8	42.0	42.0	42.1	42.0	42.1	41.8	41.7	41.8	...	...	42.0	41.8	42.0	42.0	41.8	41.9
September	42.1	42.0	42.1	42.3	42.2	42.3	42.1	42.0	42.3	42.4	42.5	42.1	42.4	42.1	42.0	42.0	...	...	42.3	41.9	42.2	42.4	42.2	42.1
October	42.4	42.3	42.3	42.5	42.4	42.6	42.3	42.2	42.5	42.6	42.6	42.5	42.6	42.3	42.3	42.2	...	...	42.4	42.0	42.5	42.6	42.3	42.3
November	42.7	42.5	42.6	42.6	42.5	42.9	42.4	42.2	42.5	42.5	42.6	42.8	42.8	42.6	42.5	42.5	...	...	42.7	42.5	42.9	43.0	42.8	42.7
December	43.1	42.8	43.0	43.2	43.1	43.5	43.0	42.8	43.0	43.0	43.0	43.2	42.9	42.8	42.8	42.8	...	...	43.0	42.8	43.1	43.2	43.0	43.0
1928																								
January	43.3	43.0	43.2	43.5	43.4	43.8	43.3	43.1	43.3	43.3	43.3	43.5	43.3	43.1	43.0	43.0	...	...	43.2	43.0	43.3	43.4	43.2	43.2
February	43.5	43.2	43.4	43.7	43.6	44.0	43.5	43.3	43.5	43.5	43.5	43.7	43.5	43.3	43.2	43.2	...	...	43.4	43.2	43.6	43.7	43.5	43.5
March	...	...	...	...	43.8	44.2	43.7	43.5	43.7	43.7	43.7	44.0	43.8	43.6	43.5	43.5	...	...	43.6	43.4	43.9	44.1	43.9	43.9

*Holiday.

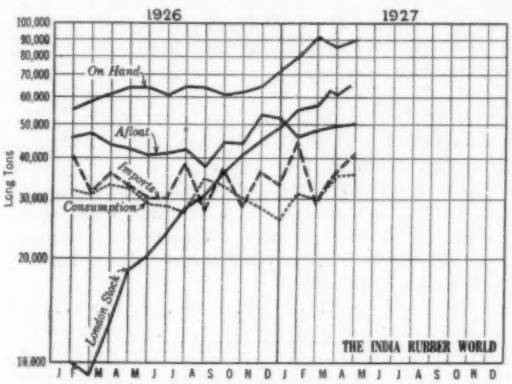
The following crude rubber importers, dealers, and brokers are listed in our Buyers' Directory. For complete information see Index of Advertisers on Page 102

Araujo, J. G. & Co., Manaos, Brazil.
Astlett, H. A., & Co., New York, N. Y.
Baird Rubber & Trading Co., New York, N. Y.
Buckleton & Co., Ltd., Liverpool, England.
Chalfin, Joseph, & Co., Inc., New York, N. Y.
Chipman, R. L., New York, N. Y.
Dunbar, F. W., & Co., Inc., New York, N. Y.
Dunbar, J. Frank, Co., Inc., New York, N. Y.
Hankin, George, & Co., London, England.
Hardy, R. S., Co., New York, N. Y.
Henderson Brothers & Co., Inc., New York, N. Y.
Hentz, H. & Co., New York, N. Y.
Hirsch, Adolph, & Co., New York, N. Y.
Jacoby, Ernest, Boston, Massachusetts.
Littlejohn & Co., Inc., New York, N. Y.
Muehlstein, H. & Co., New York, N. Y.
Nordmann, Rossmann & Co., Hamburg, Germany.
Wilson, Charles T., Co., Inc., New York, N. Y.

Imports, Consumption and Stocks

The accompanying graph covers the crude rubber supply, consumption and stocks for 1926 and the first five months of 1927.

Stocks on hand in the United States dropped from 91,086 tons on February 28 to 85,737 tons on March 31. It is estimated that



U. S. Imports, Consumption, Stocks, 1926-27

stocks on April 30 will regain the 90,000 ton level. Imports will have reached 41,000 tons by the latter date. The consumption for the month of April will probably reach 50,000 tons. Tire production is scheduled high and the Akron section is producing about 130,000 tires daily. London stocks on April 25 were 65,511 tons, up 2,877 tons from April 2.

UNITED STATES CRUDE RUBBER IMPORTS, CONSUMPTION AND STOCKS

	Imports Tons	Consumption Tons	Stocks On Hand† Tons	Stocks Afloat† Tons	London Tons	Singapore and Penang Tons†
1925 Twelve months....	384,837	389,136	51,000*	48,000*	.....	.....
1926 Twelve months....	411,900	358,415	72,510*	52,019*	.....	.....
1927						
January	45,736	31,500	76,171	45,218	54,786	26,443
February	29,446	29,000	76,000	48,000	56,962	26,766
March	39,500	36,100	91,086	49,597	63,167	27,844
Apr. (estimated)...	41,000	36,000	90,000	50,000	65,511‡‡	.....

* December 31, 1925 and 1926.
† The first of each month.
‡‡ April 23, 1927.

Ceylon Rubber Exports from Jan. 1 to Jan. 20, 1927

	Tons
To United Kingdom	1,400.82
Continent	135.87
Australia	48.73
America	3,311.54
Egypt	2.00
Africa	8.00
Japan	2.69
Total	4,909.65

CEYLON ANNUAL EXPORTS, 1921-1926

	Tons
For the same period last year	1,949.25
For the year 1926	58,799.56
1925	45,697.19
1924	37,351.13
1923	37,111.88
1922	47,367.14
1921	40,210.31

Plantation Rubber Exports from Malaya

January 1 to February 28, 1927

	From Singapore Tons	From Penang Tons	From Malacca Tons
To United Kingdom	1,757.54	1,935.07	1,814.46
British Possessions	755.13	6.00	15.08
Continent of Europe	2,233.49	441.70	505.72
United States	24,806.89	4,421.93	2,311.32
Japan	1,900.23	483.50	490.50
Other countries	8.31	.....	.....
Totals	31,461.59	7,288.20	5,137.08

Reclaimed Rubber Market

Reclaimers are operating very actively and within a month may reach capacity output. The tire making season opened somewhat ahead of time, and its activity is reflected in the demand for reclaim. Quotations on about half the grades are lower than a month ago, notably in tire, high tensile, shoe, and tube grades. The technical value of reclaim continues to hold the interest of tire manufacturers who are obtaining satisfactory results in service tests.

New York Quotations

April 25, 1927

	Specific Gravity	Price Per Pound
Auto Tire		
Black	1.21	$0.08½@$0.08¾
Black, washed	1.18	.10½@ .10¾
Black selected tires	1.20	.09½@ .10
Dark gray	1.35	.12¾@ .13¼
Light gray	1.38	.13½@ .14
White	1.40	.15½@ .16
High Tensile		
Super-reclaim, No. 1 Black	1.20	.17½@ .18
No. 2 Black	1.20	.14½@ .15
High tensile red	1.20	.15 @ .15½
Shoe		
Unwashed	1.60	.08¼@ .08½
Washed	1.50	.11 @ .11¼
Tube		
No. 1	1.00	.18½@ .19
No. 2	1.18	.14 @ .14½
Miscellaneous		
Red	1.35	.15 @ .15½
Truck tire, heavy gravity	1.55	.08½@ .09
Truck tire, light gravity	1.40	.09 @ .09½
Mechanical blends	1.60	.08 @ .08½

DURING THE ENTIRE YEAR OF 1926, 95.98 PER CENT OF THE AMERICAN imports of crude rubber were entered in the customs districts of New York and Massachusetts, this figure not including the imports of guayule, jelutong, balata, gutta percha, and other crude, scrap, and reclaimed rubber. The amount of crude rubber and liquid latex received by these two districts during March totaled 75,633,001 pounds, or 33,765 long tons, the value being $27,298,255. The unit value averaged 36.09 cents a pound.

The Market for Rubber Scrap

Collections have improved during the past month and stocks have increased. There has been a moderate decline in the quotations of most scrap grades due to less active demand.

AIR BRAKE HOSE. Ordinary quality is quoted with a range of $2 in place of $3 as last month. Regular soft remains unchanged. The market is easier.

BOOTS AND SHOES. The reclaiming demand has decreased considerably. Prices are lower in consequence with the spread of quotations practically the same as a month ago.

INNER TUBES. Quotations are from ½ to ¾ cents lower on all grades. Collections have improved.

TIRES. Prices are easier and collections heavier. Stocks are moving slowly in response to a fair demand from reclaimers. The cost of collecting and transporting all grades of scrap make up a disproportionate amount of scrap costs and closely limit the areas from which collections can profitably be made. These areas broaden with the increase in demand and advance in prices.

Quotations for Carload Lots

April 25, 1927

Boots and Shoes			
Boots and shoes, black	lb.	$0.01⅞ @	$0.02
Red and white	lb.	.01⅛ @	.01⅛
Trimmed arctics, black	lb.	.00⅞ @	.01
Untrimmed arctics	lb.	.00¾ @	.00⅞
Tennis shoes and soles	lb.	.00¾ @	.00⅞
Hard Rubber			
No. 1 hard rubber	lb.	.10 @	.10½
Battery jars, black compound	lb.	.01⅞ @	.02
Inner Tubes			
No. 1, floating	lb.	.08¼ @	.09
No. 2, compounded	lb.	.06½ @	.06¾
Red	lb.	.06¼ @	.06½
Mechanicals			
Mixed black scrap	lb.	.01 @	.01⅛
Heels	lb.	.00½ @	.00⅝
Hose, air-brake	ton	36.00	@37.00
regular soft	ton	20.00	@.....
No. 1 red	lb.	.01¾ @	.01⅞
No. 2 red	lb.	.01⅜ @	.01½
White, druggists' sundries	lb.	.03½ @	.03¾
Mechanical	lb.	.01½ @	.01⅝
Mixed tubes	lb.	.06⅜ @	.06¼
Tires			
Pneumatic Standard—			
Mixed auto tires with beads	ton	26.00	@27.00
Beadless	ton	35.00	@36.00
White auto tires with beads	ton	40.00	@42.00
Beadless	ton	50.00	@52.00
Mixed auto peelings	ton	34.00	@35.00
Solid—			
Mixed motor truck, clean	ton	31.00	@33.00

UNITED STATES EXPORTS OF RECLAIMED RUBBER DURING THE YEAR 1926 totaled 12,075,640 pounds, value $1,425,460, the figures for shipments of scrap and old rubber being 29,842,702 pounds, value $1,946,894.

Metal Market Review

Prices during April of the non-ferrous metals, tin, lead and zinc particularly, have been decidedly lower, and demand has been quiet. In the steel trade there is a seasonal decline, which is said however to be this year more gradual than usual. The industry as a whole is working at 86 to 87 per cent of capacity, as against 94 per cent during March. Automotive consumers of steel continue however to place orders with little change in volume.

ALUMINUM. Virgin metal, 98 to 99 per cent pure, is quoted at 26 cents a pound, delivered.

ANTIMONY. The chaos in China has had its influence on the antimony market, forcing prices higher. The market is held in check, according to *The Iron Age*, only because of the fairly large stocks of this metal in the United States.

COPPER. Weakness in the other metals, with some reaching new low prices for the year, has had an unfavorable effect upon the copper market, there being a falling-off from the comparatively good prices of March. Export sales have also been better proportionately than domestic sales.

LEAD. There has been little buying of lead, while European prices are now lower and declining prices in this country are predicted. New York quotations on April 25 were at 7 cents a pound, while the St. Louis price was 6.60 to 6.65 cents, the lowest level reached since May 22, 1924.

STEEL. Production of steel ingots in the United States during March, according to the American Iron and Steel Institute, exceeded all output records for any previous month in the history of the industry, war times not excepted. The calculated production in March for all companies was 4,559,400 tons, or 168,867 tons daily, as against 4,488,362 tons, or 166,236 daily in March of last year, the previous high record. This large output represents the country's increasing steel demands, although the March production was partly due to a desire for reserve stocks, with the coal strike threatening.

TIN. Prices for this metal reached new low levels for the year on April 23, the quotations for spot, April and May tin being the same, 66.50 cents a pound. The tin plate makers are said to be using less coating metal than formerly.

ZINC. During the last of April a new low price for zinc was established at 6.25 cents a pound, East St. Louis, the previous low figure reached earlier in the year being 6.30 cents. Zinc sellers claim that further curtailment of production is necessary.

Basic Metals

April 24, 1927

	Cents per pound	
Aluminum, virgin, 98@99 per cent	26.00	@
Antimony	15.25	@15.50
Copper—Lake, spot	13.125	@13.25
Electrolytic, spot	13.125	@
Castings, refinery	12.75	@
Lead, spot, New York	6.95	@ 7.00
Lead, spot, East St. Louis	6.625	@ 6.65
Nickel, ingot, pound	35.00	@
Tin, spot	66.50	@
Zinc, spot, New York	6.60	@ 6.65
Zinc, spot, East St. Louis	6.25	@ 6.30

Steel Wire

	Base per 100 lbs.	
Bright, plain wire No. 9 gage	$2.40	@
Annealed fence wire	2.55	@
Galvanized wire No. 9	3.00	@
Spring wire	3.40	@

Copper Wire

BASE PRICE F. O. B. FACTORY

	Cents per pound	
Bare copper wire	15.125	@
No. 6, B. & S. gage	15.125	@
No. 8, B. & S. gage	15.125	@
No. 14, B. & S.	16.125	@

IN THE GENERAL ECONOMIC REVIVAL PREVAILING IN GERMANY during 1926 the rubber industry also registered an advance, according to the following statistics published by *Commerce Reports*: imports in 1925 of rubber, gutta percha, etc., were valued at 184,000,000 marks; in 1926, 126,000,000 marks. Exports of rubber goods in 1925, value 95,000,000 marks, in 1926, 98,000,000 marks.

Compounding Ingredients Market

COMPOUNDING ingredients generally are being absorbed very freely by rubber manufacturers who are operating on full schedules, particularly in tires and tubes. There was no price cutting during April although there is a strong tendency to shade still further the already low prices on the cheap fillers. The prices on mineral rubber are firm. In regard to accelerators the practice is gaining for manufacturers to adopt those that effect cures at 20 pounds of steam in moderately short time. This concerted movement is stimulating inquiries and sales.

ACCELERATORS. Competition is keen among producers to develop semi-ultra and non-poisonous accelerators that will be reasonably free from the danger of scorching yet cure at the temperature of 20 pounds of steam. A new accelerator of this type A-16 is announced and at least another is scheduled soon to appear.

ANTI-OXIDANTS. The increasing use of reclaims has stimulated the consumption of anti-oxidants and accelerators because of their tonic effect, as it were, in developing quality and good aging.

BENZOL. Early in April the demand increased owing to a decline of one cent per gallon on all grades, and the market became steady with decrease of stocks.

CARBON BLACK. There was a fair movement against contracts with spot quiet. The price is firm at unchanged levels of a month ago.

LITHARGE. The demand improved as April advanced, due to lengthening of the period within which a decline of litharge is guaranteed. April 25 announcement was made of 25 cents reduction per 100 pounds on the commercial grade.

LITHOPONE. Inquiries are active. Consumers are drawing heavily on contracts and the price is well held.

MINERAL RUBBER. This material is as well established in the industry as rubber itself and finds a place in rubber mixing formulas of all but a few types. It ranks as a softener like whiting as a diluent, that is, it is harmless and cheap.

SOLVENT NAPHTHA. Stocks are fairly large, demand good and prices firmer.

ZINC OXIDE. Competition on spot has eased up somewhat. Requests for stock are active and consumers are taking shipments in greater volume.

New York Quotations

April 25, 1927

Accelerators, Inorganic

Lead, carbonate	lb.	$0.09¼	@
Lead, red	lb.	.10¼	@
sublimed white	lb.	.09	@
sublimed blue	lb.	.09	@
super-sublimed white lead	lb.	.09½	@
Lime, R. M. hydrated	ton	15.00	@25.00
Litharge	lb.	.09¼	@
Magnesia cal., light (bbls.)	lb.	.15	@
calcined, extra light (bbls.)	lb.		@
calcined, heavy (bbls.)	lb.	.04	@ .04¼
magnesium, carb., light		.06	@ .06½
Orange mineral A.A.A	lb.	.12½	@
Rubber lead No. 4	lb.		@

Accelerators, Organic

Aldehyde ammonia	lb.	.80	@ .85
Crylene, hard form	lb.		@
Paste	lb.		@
Di-ortho-tolylguanidine	lb.	.85	@ .90
Diphenyl guanidine	lb.	.68	@ .72
Ethylidine aniline	lb.		@
Formaldehyde aniline	lb.		@
Grasselerator 102	lb.	.80	@ .82½
552	lb.	4.80	@ 5.00
808	lb.	1.15	@ 1.35
Heptene	lb.		@
Hexamethylene tetramine	lb.	.80	@ .85
Hydrofuramide	lb.		@
Lithex	lb.		@
Methylene aniline	lb.		@
Methylene dianiline	lb.	.38	@ .40
Monex	lb.		@
No. 999 lead oleate	lb.	.16½	@
Phenyl orthotolyl guanidine	lb.	.76½	@ .81
Piperidine penta-dithio-carb.	lb.	4.80	@ 5.50
R. & H. 50 (100 lb. drums)		.60	@ .68
Tensilac No. 39	lb.	.55	@ .60
No. 41	lb.	.65	@ .68
Thionex	lb.	3.25	@
Thiocarbanilid	lb.	.22	@ .30
Trimene	lb.		@
base	lb.		@
Triphenylguanidine	lb.	.65	@ .69
Vulcanex	lb.	.86	@
Vulcanol	lb.	1.08	@
Vulcone	lb.	.74	@
W-29	lb.		@
W-87	lb.		@

Acids

Acetic 28% (bbls.)	100 lbs.	3.63	@
glacial (carboys)	100 lbs.	12.66	@
Oleic	lb.		@
Stearic	lb.	.13½	@ .14
Sulphuric, 66%	100 lbs.	1.60	@

Alkalies

Caustic soda, solid	100 lb.	$3.00	@
Sulphite soda	100 lbs.	3.50	@

Anti-Oxidants

Antox	lb.	.83	@
V. G. B	lb.		@

Colors

BLACK

Bone	lb.	.05	@ .21
Carbon (see Comp. Ing.)			
A. & W. nonfil No. 1	lb.	.40	@
No. 2	lb.	.25	@
Drop	lb.	.06	@ .10
Lampblack (commercial)	lb.	.09	@

BLUE

A. & W. blue	lb.	1.25	@ 5.00
Du Pont, N.	100 lbs.	1.35	@
Marine, A. C.	100 lbs.	1.30	@
5 R	100 lbs.	1.00	@
2 G	100 lbs.	.90	@
Prussian	lb.	.33	@ .35
Ultramarine	lb.	.09	@ .25

BROWN

Sienna, Italian	lb.	.04	@ .08

GREEN

A. & W. green	lb.	1.25	@ 3.00
Chrome, light	lb.	.27	@
medium	lb.	.29	@
dark	lb.	.31	@
Du Pont, A. C.	100 lbs.	3.00	@
4 G	100 lbs.	.60	@
G. L.	100 lbs.	.30	@
Y. L.	100 lbs.	.75	@
Oxide of chromium	lb.	.38	@

ORANGE

Du Pont, 2 R	100 lbs.	1.40	@
R. X.	100 lbs.	1.30	@
Y. O.	100 lbs.	1.60	@

RED

A. & W. red	lb.	.75	@ 3.50
purple	lb.	2.00	@ 4.00
Antimony, golden, No. 40	lb.	.22	@ .25
No. 60	lb.	.16	@ .20
golden 15/17%	lb.	.20	@
T. K. "Special" 1%	lb.	.38	@
Pentasulphide 15/17%	lb.	.18	@

Colors—*(Continued)*

Antimony,			
Crimson, R.M.P. No. 3	lb.	$0.48	@
Sulphur free	lb.	.52	@
T. K. 15/17%	lb.	.40	@
Sulphur free	lb.	.50	@
7-A	lb.	.35	@
Z-2	lb.	.20	@
Vermilion, No. 5	lb.	.50	@ .55
No. 15	lb.	.37½	@ .42
Du Pont R. I.	100 lbs.	2.00	@
6 B	100 lbs.	1.10	@
Brilliant A. C.	100 lbs.	1.10	@
Iron Oxides			
bright pure domestic	lb.	.12	@
bright pure English	lb.	.14	@
bright reduced English	lb.	.10½	@
bright reduced domestic	lb.	.10	@
Indian (maroon), pure domestic	lb.	.11	@
Indian (maroon), pure English	lb.	.10½	@ .11½
Indian (maroon), reduced English	lb.	.09½	@ .10¼
Indian (maroon), reduced domestic	lb.	.08	@
Oximony	lb.	.13¼	@
Spanish red oxide	lb.	.04	@
Venetian reds	lb.	.02	@ .06
Vermilion, English quicksilver	lb.	1.97	@ 2.00

WHITE

Lithopone	lb.	.05½	@
Azolith	lb.	.05¼	@ .05⅜
Grasselli	lb.	.05¾	@
Sterling	lb.	.05⅜	@ .06⅜
Zinc Oxide			
AAA (lead free)	lb.		@
Azo (factory):			
ZZZ (lead free)	lb.	.06½	@ .07
ZZ (leaded)	lb.	.06⅝	@ .07⅛
Z (8% leaded)	lb	.06⅝	@ .07⅛
French Process			
Green seal	lb.	.10⅝	@
Red seal	lb.	.09⅝	@
White seal	lb.	.11⅞	@

YELLOW

A. & W. yellow	lb.	2.00	@ 4.00
T. K. sulphide	lb.	.65	@
Cadmium sulphide	lb.	1.50	@
Chrome	lb.	.17	@ .18
Du Pont N.	100 lbs.	4.00	@
R. R.	100 lbs.	1.55	@
Grasselli cadmium	lb.	1.50	@
Ochre, domestic	lb.	.01⅝	@ .02
imported	lb.	.04	@ .04⅛
Oxide, pure	lb.	.11	@
Zinc imp.	lb.	.24	@

New York Quotations

April 25, 1927

Compounding Ingredients

Aluminum flake (sacks c.l.)	ton	$21.85	@
(sacks l.c.l.)	ton	24.50	@
Ammonium carbonate powd.	lb.	.12	@
lump	lb.	.11	@
Asbestine	ton	13.50	@14.50
Barium, carbonate	ton	52.00	@
dust	lb.	.05	@ .06
sulphate	lb.	.03½	@
Barytes, imported	ton	27.00	@36.00
water ground and floated	ton	34.00	@35.00
Basofor	lb.	.04½	@
Blanc fixe, dry	ton	85.00	@90.00
pulp	ton	60.00	@63.00
Carbon Black			
Aerfloted arrow	lb.	.09	@ .13
Compressed	lb.	.07½	@ .11½
Uncompressed	lb.	.07	@ .11
Micronex	lb.	.08	@ .12
Carrara filler	lb.	.01½	@
Chalk	ton	18.00	@20.00
Clay china	lb.	.01½	@
Langford	ton		@
Mineral flour (Florida)	ton	20.00	@23.00
Perfection	ton	16.00	@27.00
Suprex	ton	13.00	@26.00
Cotton flock, black	lb.	.10½	@ .12
light-colored	lb.	.10½	@ .12
white	lb.	.12	@ .28
Fossil flour	lb.	.02½	@
Glue, high grade	lb.	.20	@ .29
low grade	lb.	.18	@ .20
Infusorial earth	lb.	.02½	@
Mica, amber (fact'y)	lb.	.05	@
Pumice stone, powd.	lb.	.02½	@ .04
Rotten stone (bbls.)	lb.	.02½	@ .04½
Soap bark	lb.	.13½	@ .14
Soapstone	ton	15.00	@22.00
Sodium bicarb.	100 lbs.	.02½	@
Stearex	lb.	.10	@ .14
Talc, domestic	lb.	.01½	@
French	ton	18.00	@22.00
Velvetex	lb.	.04	@ .07

Compounding Ingredients—*(Continued)*

Whiting:			
Commercial	100 lbs.	$0.85	@$1.00
English, cliffstone	100 lbs.	1.50	@
Snow white	ton	12.00	@23.00
Westminster Brand	100 lbs.		@
Witco (c.l.) (fact'y)	ton	12.00	@20.00
Whiting, imp. chalk	100 lbs.	.90	@ 1.00
Paris White, Eng. Cliff	100 lbs.	1.50	@ 3.00
Wood flour	ton		@

Mineral Rubber

Genasco (facty.)	ton	50.00	@52.00
Gilsonite (fact'y)	ton	37.14	@39.65
Hydrocarbon, soft	ton	28.00	@34.00
Ohmlac Kapack, M. R.	ton	60.00	@
M-4	ton	175.00	@
Paradura (fact'y)	ton	62.50	@65.00
Pioneer, M. R., solid (fac.)	ton	41.00	@43.00
M. R. granulated	ton	51.00	@53.00
Robertson, M. R. solid (facty.)	ton	34.00	@80.00
M. R. gran. (facty.)	ton	34.00	@80.00

Oils (Softeners)

Castor, No. 1, U. S. P.	lb.	.14½	@
No. 3, U. S. P.	lb.	.13½	@
Corn, crude (bbls.)	lb.	.11	@
Cotton	lb.	.09	@ .10
Fluxrite fluid	lb.	.05	@ .06
solid	lb.	.05	@ .06
Glycerine	lb.	.26	@ .26½
Linseed, raw	lb.	.11	@
Palm lagos (bbls.)	lb.	.10	@
niger (bbls.)	lb.	.09	@
Peanut, crude	lb.	.12½	@
refined	lb.	.14	@
Petrolatum, standard	lb.		@
sticky	lb.		@
Pine, steam distilled	gal.	.70	@
Plastone	lb	.39	@
Rapeseed, refined	lb.	.11½	@
Rosin	gal.	.65	@

Resins and Pitches

Pitch	bbl.	9.50	@10.50
Ponto	lb.		@
Rosin, K (bbl.)	280 lbs.	11.15	@
Shellac, fine orange	lb.	.70	@
Tar, retort	bbl.	16.00	@16.50

Solvents

Benzol (90%, 7.21 lbs. gal.) pure	gal.	$0.29	@
Carbon bisulphide (10.81 lbs. gal.) 99.9% pure (drums)	lb.	.03½	@ .06¼
tetrachloride (13.28 lbs. gal.) 99.7% pure (drums)	lb.	.06¾	@
Gasoline			
No. 303			
Tankcars	gal.	.16½	@
Drums, c. l.	gal.	.22½	@
Drums, l. c. l.	gal.	.24½	@
Naphtha	gal.	.40	@
Turpentine, spirits	gal.	.66½	@ .67½
wood, steam distilled	gal.	.64	@ .66

Substitutes

Black	lb.	.08	@ .14
Brown	lb.	.08	@ .15
White	lb.	.09	@ .17

Vulcanizing Ingredients

Sulphur			
Velvet flour	100 lbs.	2.60	@ 3.50
Soft rubber (c.l.)	100 lbs.	2.60	@ 2.95
(l.c.l.)	100 lbs.	2.95	@ 3.30
Superfine commercial flour (c.l.)	lb.	2.20	@ 2.80
(l.c.l.)	lb.	2.80	@ 3.10
Tire brand, superfine	100 lbs.	2.20	@ 2.55
Tube brand, velvet	100 lbs.	2.60	@ 2.95
(See also Colors—Antimony)			

Waxes

Beeswax, white, com.	lb.	.55	@
carnauba	lb.	.38	@ .50
ceresine white	lb.	.13	@
montan	lb.	.07	@ .07¼
ozokerite, black	lb.	.30	@
green	lb.	.32	@

Paraffin

122/124 white crude scale	lb.	.03½	@ .03¾
124/126 white crude scale	lb.	.03¾	@ .03⅞
123/125 fully refined	lb.	.04⅛	@ .04¼
125/127 fully refined	lb.	.04⅜	@ .04¼

VULCANIZING RUBBER LATEX

The Society of the Netherlands Fisheries Experiment Station, The Hague, Netherlands, has applied for a patent for a process of vulcanizing rubber latex, particularly for the purpose of coating yarns, fabrics, etc.

According to the process, more or less unstable sulphur compounds are added to the latex. These compounds give up their sulphur for the vulcanization of the latex when they come in contact with the air (oxygen) while the other decomposition products are volatile. Sulphide of ammonium in which free sulphur is dissolved, organic sulphur compounds like alkylammonium-sulphides, for instance tetramethylammonium-sulphide, also ammonium salts of tetrathioglycolic acid, trithio-allophanic acid, trithio-carbonic acid, etc., may be used. Commercial latex always contains ammonium as anticoagulant so that it can be mixed in almost all proportions with sulphide of ammonium or ammonium-polysulphides. If this mixture is dried in the air, the water and ammonium evaporate in the air and only the sulphur remains in the latex, by which vulcanization takes place.

Besides the above, vulcanization catalyzers like pyridine, piperidine, etc., may advantageously be added to the latex.

The new method of vulcanization is of special importance for preserving yarns, fabrics, etc., because there is no acid present in the vulcanization liquid that can damage the fiber.

For saturating nets, for instance, a latex containing 30 to 35 per cent of pure rubber, to each liter of which is added 150 cc. of an ammoniumpoly-sulphide solution containing 100-150 gr. of sulphur per liter, is used. Or 100 gr. of trithiocarbonic acid ammoniac to one liter of latex with the same rubber content could be employed.

As soon as it is saturated with the liquid, the net is stretched out and dried in the sun as far as possible. Vulcanization takes place simultaneously with the drying, in contrast to a known process (Netherlands Patent No. 11,994) in which materials are treated with latex that has been vulcanized in advance according to any method, for instance by addition of natriumpolysulphide and heating.

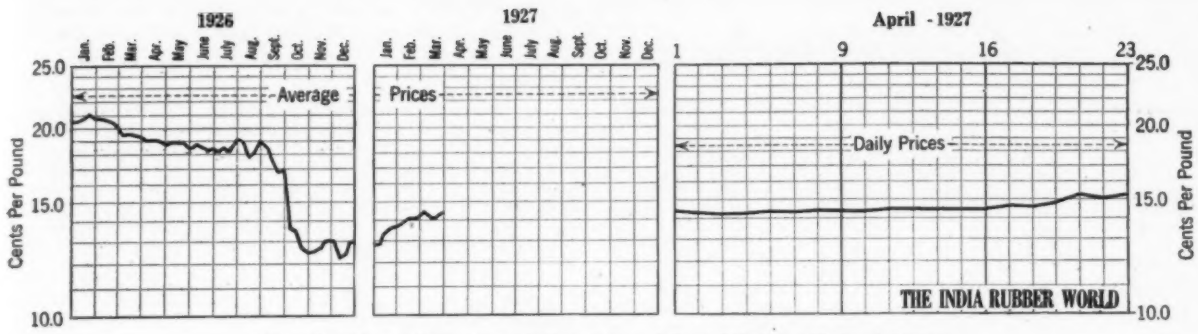
NON-FLAMMABLE RUBBER SOLVENT

Ethylene dichloride is an excellent solvent for rubber. It weighs 10.4 pounds per gallon and may be used to advantage in the preparation of rubber cement or for the wetting of rubber to effect adherence to one layer or another. It can also be used as a carrier for sulphur chloride in cold curing process. Not only is ethylene dichloride of interest due to its high solvent action on rubber but also due to the increased safety which the use of ethylene dichloride will effect in contrast with the use of gasoline or benzol. While ethylene dichloride will burn it does so with difficulty and may readily be extinguished. Its lower explosive limit in air is 6.25 per cent as compared with 1.5 per cent for gasoline or benzol.

Ethylene dichloride possesses a further advantage in being completely miscible with carbon tetrachloride and if, therefore, it is desirable to produce an absolutely non-flammable mixture, this can be accomplished by the addition of approximately 30 per cent of carbon tetrachloride by volume. Another point is that ethylene dichloride can not be exploded by a static spark.

UNITED STATES IMPORTS OF CRUDE RUBBER DURING THE TWELVE months ended December, 1926, totaled 925,877,712 pounds, value $505,817,807. The figures for gutta percha were 3,236,704 pounds, value $661,156, and for balata, 792,165 pounds, value $327,213.

WAREHOUSED STOCKS IN JAPAN OF RUBBER, CRUDE AND MANUfactured, had a value in January, 1927, of 900,000 yen, the figure for the month following being 1,300,000 yen. The average exchange value of the yen in February was $0.4884.



Ratio Graph of New York Daily Prices of Spot Middling Upland Cotton

Market for Cotton and Fabrics

AMERICAN COTTON. The prices for spot middling cotton in April showed a gradual increase over those for March. April 1 spot was 14.4 cents and April 23, 15.25 cents. The market has held continuously steady. The old crop statistics were seemingly discounted and traders awaited new crop prospects. There was no general buying and offerings were light. Exports have been heavy and domestic consumption very large. Rains interfered with preparations for planting before the disastrous floods inundated the lower Mississippi valley.

EGYPTIAN COTTON. From Egypt it is reported that the coming crop will be smaller than last year. This applies to both Sakel and Uppers. On the other hand, demand from the fine spinning industry has not been keen for many months and the carryover in Egypt at the end of the present season promises to be very large.

ARIZONA COTTON. It is accepted as certain that the staple area in Arizona will show a substantial increase over that of last season.

All staple cottons have recently been very firm because of the flood conditions throughout the rich staple lands of the Mississippi delta, where it is now feared that the area devoted to cotton will be drastically curtailed or the planting will be so delayed that the crop will be subject to frost damage next fall.

Cotton Fabrics

DUCKS, DRILLS AND OSNABURGS. The market for mechanical ducks is active. The trend is to buy through August up to the new crop.

RAINCOAT FABRICS. The raincoat trade continued very quiet the past two months due to being between seasons. Rubberizers have been preparing their samples and deciding upon their fabrics.

SHEETINGS. There was less buying during the last week with prices holding practically steady. The cotton market has been rather firm and advancing. The indications now are that buying during the summer will be on a basis of 30 day requirements by consumers.

TIRE FABRICS. During April the demand from tire manufacturers was more or less irregular but fair in amount. The first week of April was rated as rather quiet yet the fabric sales exceeded 1,000,000 pounds, followed the next week by good commitments. Inquiries for April-June deliveries could not be handled. Fabric mills operated by tire companies are producing faster than normal, those operating independently are not so busy and are figuring on July-September requisitions. Square woven fabrics are regarded as obsolete. There is a slight tendency to advance fabric prices with cotton.

The price basis for carded peeler cords is now 37 to 39 cents, while combed Egyptians are held for 49 to 50 cents and combed peelers for 41 to 44 cents. A number quote higher, but business has been lost during the last few days at the lower quotations. Because fabric mills are sold up for current deliveries somewhat higher prices apply in a few quarters for quick deliveries.

New York Quotations
April 25, 1927

Drills

38-inch 2.00-yard	yard	$0.15¼ @
40-inch 3.47-yard		.09⅞ @
52-inch 1.90-yard		.16⅞ @
60-inch 1.52-yard		.21⅞ @

Ducks

38-inch 2.00-yard	yard	.15¼ @
40-inch 1.47-yard		.21⅞ @
72-inch 16.66-ounce		.34½ @
72-inch 17.21-ounce		.35½ @
MECHANICAL		
Hose and belting	pound	.29 @
Specials		.33 @
TENNIS		
52-inch 1.35-yard	yard	.23¼ @

Hollands

RUBBER TRADE SPECIAL		
R. T. 3 A.		
31-inch	yard	.20 @
40-inch		.25 @
50-inch		.45 @
RED SEAL		
36-inch		.14½ @
45-inch		.15 @
90-inch		.22½ @
GOLD SEAL		
40-inch, No. 72		.19 @
40-inch, No. 80		.20½ @

Osnaburgs

40-inch 2.35-yard	yard	$0.13½ @
40-inch 2.48-yard		.12⅝ @
40-inch 3.00-yard		.10½ @
37-inch 2.42-yard		.13⅛ @

Raincoat Fabrics

COTTON		
Bombazine 60 x 64	yard	.11 @
Bombazine 60 x 48		.10 @
Plaids 60 x 48		.11¼ @
Plaids 48 x 48		.10½ @
Surface prints 60 x 48		.11¾ @
Surface prints 64 x 60		.12¾ @

Sheetings, 40-inch

48 x 48, 2.50-yard	yard	.11 @	.11¼
48 x 48, 2.85-yard		.09¾ @	.09⅞
64 x 68, 3.15 yard		.10¾ @	.10¾
56 x 60, 3.60-yard		.09 @	.09⅛
48 x 44, 3.75-yard		.07⅛ @	.07⅛

Sheetings, 36-inch

48 x 48, 5.00-yard	yard	.06¼ @	.06⅛
44 x 40, 6.15-yard		.05¼ @	

Tire Fabrics

SQUARE WOVEN 17¼-ounce		
Egyptian, karded	pound	$0.45 @
Peeler, karded		.38 @
CORD 23/5/3		
Egyptian, combed	pound	.50 @
Egyptian, karded		.45 @
Peeler, karded, 1 1/32-in.		.38 @
CORD 23/4/3		
Peeler, karded	pound	.39 @
CORD 23/3/3		
Peeler, karded	pound	.46 @
CORD 13/3/3		
Peeler, karded	pound	.35½ @
CORD 13/3/3		
Peeler, karded	pound	.35 @
LENO BREAKER		
Peeler, karded	pound	.36½ @
10-oz. Peeler, karded		.36½ @
CHAFER		
8.25-oz. Peeler, karded (2 ply)	pound	@
9.5-oz. Peeler, karded (4-ply)		@
12-oz. Peeler, karded		.40 @
14-oz. Peeler, karded		.37 @

The Cotton Outlook

Record Consumption and Exports

COTTON problems have been intensified during the last of April by the news of the disastrous overflows in the Mississippi Valley, which are said to have covered with water several millions of acres of cotton country. While these reports may be considerably exaggerated, they have had a decided effect on the markets, the price of cotton rising on April 21 practically $3 a bale with the news of especially bad breaks in the main levees of the Mississippi River. Weather conditions in other sections of the cotton belt, and indications, however untrustworthy, of cuts in the cotton acreage are also not without influence on cotton prices.

Cotton consumption has meanwhile been breaking all United States records, according to figures prepared by the Census Bureau, the March total of 694,193 bales of lint being equaled only by the estimate for March a year ago of 635,896 bales. The census report also shows a total for the first eight months of the season which is about 200,000 bales more than the previous high record made during the season of 1916-17.

Statistics compiled by the Department of Agriculture also indicate this unusual advance, the estimate for cotton exports from August 1 to April 14 being 9,200,000 bales, compared with 6,733,000 bales for the same period a year ago. According to the Garside Cotton Service:

> World consumption of American cotton, exclusive of linters, in the first half of the current season, i.e., August 1 to January 31, totaled 7,508,000 bales as compared with 7,303,000 in the first half of last season. Consumption in the first half of the current season was on a basis of just about 15,000,000 bales, with prospects that consumption in the second half season will be considerably larger. In view of this, it appears that an estimate of 15,500,000 consumption in the full season is conservative.

American Cotton Industry Shows Greater Stability

Several interesting and thoughtful reviews of present conditions in the cotton industry have been recently published, one of these, appearing in *The Textile World* and entitled "Cotton's Even Balance Causes Stability," being written by Dr. Lewis H. Haney, director of the Business Research Bureau of the New York University. Dr. Haney believes that although the carry-over at the end of the season will probably be at least 4,000,000 bales, there will be a further increase in world consumption, and says in part:

> With cotton as reasonably priced as it now is, there is every reason to believe that a rather strong upward trend in consumption will develop. Last year it is estimated that the world consumed about 13.7 million bales of American cotton. In the first half of the present cotton year it is estimated that around 7.2 million bales have been consumed and that the consumption in the second half will be somewhat larger, bringing the total up to 15,000,000 bales, or more. American cotton is particularly favored at present because of conditions in India and China. The activity of cotton manufacturers in north and central Europe is large and increasing.
>
> On the whole, the balance is a little more favorable, or less unfavorable, than it has been in the last two or three months.

A concise summary has also been made by the National Bank of Commerce in New York, the following being quoted from the *Commerce Monthly*:

> Increased mill consumption and the sharp drop in foreign grown cottons are restoring the balance between cotton consumption and supplies. No recent fact has been of such constructive force in the cotton market as the sharp drop in the production of foreign grown cottons. There will be nearly a million and a quarter bales less of these cottons this year than there were last. Of almost equal importance is the news that world mill consumption in the first half of the 1926-27 crop year ran 600,000 bales ahead of that in the previous six months.
>
> The acreage for the crop just harvested in India is three million less than that of 1926. This reduction has been one of the principal influences which has made American cotton more popular abroad in the past few months. Egypt has already taken steps to reduce the amount of land going into cotton this spring. Comments on reduction programs are heard from such widely scattered places as Uganda, Peru, and the Laguna district of Mexico. The movement to bring production down to the levels of consumption is proceeding on a world-wide scale.
>
> A year ago world consumption rose sharply for the six months ended with January and from then until July remained fixed at this level. After such evidence that cotton consumption might not be easily expanded over the very fair total already reached the new gain this season is very impressive. Some indication that this gain will be maintained is contained in the statement made for a considerable part of the industry in the United States that unfilled orders at the beginning of March were over 60 per cent larger in 1927 than in 1926. . . .
>
> All in all, then, it may be confidently expected that if prices are maintained at levels which will continue to stimulate consumption and something like average crop conditions prevail the problem created by the present cotton surplus will be dissipated in a very natural way.

Revived Interest in Sea Island

The relatively high prices for long staple cotton have been arousing keen interest in the projects for growing Sea Island cotton in those sections of the southeastern states where the crop was formerly grown. It is believed that the boll weevil is no longer a menace to the American cotton crop and that the production of Sea Island cotton can be resumed on the same basis as in former years under the old mixed-variety system of planting.

Cotton specialists of the Department of Agriculture state however that improved methods of production and marketing must be established if the experiment is to be a success, and that an adequate supply of pure seed is the first essential, the district also being limited to one variety to prevent mixing and crossing.

Any efforts, therefore, to resume the production of Sea Island or Meade cotton in the southeastern states would need to be organized for an exclusive production of one variety and continued for several years in order to determine the advantages of isolated planting and improved cultural methods.

AMONG THE ORGANIZATIONS DISPLAYING AT THE KNITTING ARTS Exhibition, held in Philadelphia from April 4 to 8 inclusive, were the following: H. W. Butterworth & Sons Co., Philadelphia, Pennsylvania; the Cooper Hewitt Electric Co., Hoboken, New Jersey; E. I. du Pont de Nemours & Co., Wilmington, Delaware; the General Electric Co., Schenectady, New York; and the National Aniline & Chemical Co., New York, N. Y.

United Kingdom Rubber Statistics

Imports

	February, 1927		Two Months Ended February, 1927	
UNMANUFACTURED	Pounds	Value	Pounds	Value
Crude rubber				
From—				
Straits Settlements	11,966,900	£960,157	25,084,700	£2,030,905
Federated Malay States	5,063,400	409,552	9,997,200	817,988
British India	1,251,900	100,443	2,402,600	195,527
Ceylon and Dependencies	4,444,800	351,281	9,212,900	734,865
Other Dutch possessions in Indian Seas	1,390,200	113,958	3,426,400	288,000
Dutch East Indies (except other Dutch possessions in Indian Seas)	1,969,600	159,275	4,814,700	393,469
Other countries in East Indies and Pacific, not elsewhere specified	209,700	15,222	430,000	33,474
Brazil	816,300	49,527	2,003,600	123,454
Peru	.....	.....	.....	.....
South and Central America (except Brazil and Peru)	11,300	730	42,800	3,035
West Africa:				
French West Africa	21,300	1,104	60,800	3,284
Gold Coast	98,900	6,476	140,200	9,685
Other parts of West Africa	100,400	7,977	265,100	20,872
East Africa, including Madagascar	26,700	2,018	196,000	15,242
Other countries	120,800	7,708	175,300	12,121
Totals	27,492,200	£2,185,428	58,252,300	£4,681,921
Waste and reclaimed rubber	574,800	£5,932	1,124,100	£18,026
Gutta percha and balata	467,000	35,363	1,338,000	120,770
Rubber substitutes	2,400	120	41,700	1,596
Totals	1,044,200	£41,415	2,503,800	£140,393
MANUFACTURED				
Boots and shoes....*doz. pairs*	32,568	£40,936	63,903	£104,490
Tires and tubes				
Pneumatic				
Outer covers	.....	315,152	.....	665,000
Inner tubes	.....	52,796	.....	82,889
Solid tires	.....	18,111	.....	45,855
Other rubber manufactures	.....	125,076	.....	267,540
Totals	.....	£552,071	.....	£1,165,774

Exports

UNMANUFACTURED				
Waste and reclaimed rubber	2,318,200	£25,227	4,275,500	£46,968
Rubber substitutes	60,700	1,556	141,700	3,442
Totals	2,378,900	£26,783	4,417,200	£50,410
MANUFACTURED				
Boots and shoes....*doz. pairs*	14,515	£24,323	28,448	£47,347
Tires and tubes				
Pneumatic				
Outer covers	.....	248,996	.....	541,172
Inner tubes	.....	60,465	.....	117,351
Solid tires	.....	31,116	.....	70,241
Other rubber manufactures	.....	217,793	.....	443,467
Totals	.....	£582,693	.....	£1,219,578

Exports—Colonial and Foreign

	February, 1927		Two Months Ended February, 1927	
UNMANUFACTURED	Pounds	Value	Pounds	Value
Crude rubber				
To—				
Russia	2,032,400	£191,720	3,831,800	£450,039
Sweden, Norway and Denmark	237,100	21,471	411,300	39,998
Germany	2,105,300	165,032	3,574,600	287,911
Belgium	219,400	17,640	491,900	39,591
France	1,423,200	116,843	3,793,300	307,114
Spain	168,100	12,722	297,600	23,955
Italy	727,400	59,814	1,331,700	107,151
Other European countries	343,400	29,211	613,200	53,222
United States	2,955,600	239,098	3,723,000	301,917
Canada	2,400	322	3,600	508
Other countries	47,900	4,897	121,200	12,376
Totals	10,262,200	£858,770	18,193,200	£1,623,782
Waste and reclaimed rubber	5,800	£247	68,500	£1,529
Gutta percha and balata	62,100	6,026	79,700	7,605
Rubber substitutes	6,500	240	6,500	240
Totals	74,400	£6,513	154,700	£9,374
MANUFACTURED				
Boots and shoes....*doz. pairs*	475	£1,710	2,161	£5,052
Tires and tubes				
Pneumatic				
Outer covers	.....	49,946	.....	128,739
Inner tubes	.....	4,092	.....	15,730
Solid tires	.....	283	.....	1,705
Other rubber manufactures	.....	8,404	.....	15,967
Totals	.....	£64,435	.....	£167,193

Dominion of Canada Rubber Statistics

Imports of Crude and Manufactured Rubber

	January, 1927		Ten Months Ended January, 1927	
UNMANUFACTURED	Pounds	Value	Pounds	Value
Rubber, gutta percha, etc.				
From United Kingdom	38,037	$14,899	102,226	$38,662
United States	3,658,162	1,527,944	32,588,197	15,115,303
Straits Settlements	578,961	216,056	2,912,125	1,215,229
Dutch East Indies	37,520	15,640	292,887	142,399
France	23,315	4,222	25,902	4,714
Other countries	.....	.....	11,200	15,600
Totals	4,335,995	$1,778,761	35,932,537	$16,531,907
Rubber, recovered	888,127	$119,799	6,601,599	$804,361
Rubber, powdered and rubber or gutta percha scrap	948,452	72,624	6,294,707	385,211
Balata	.....	.....	6,000	3,968
Rubber substitutes	50,468	9,551	641,049	76,114
Totals	1,887,047	$201,974	13,543,355	$1,269,654
PARTLY MANUFACTURED				
Hard rubber sheets and rods	4,858	$3,464	86,379	$50,927
Hard rubber tubes	.....	3	.....	8,699
Rubber thread not covered	11,374	15,690	118,431	182,167
Totals	16,232	$19,157	204,810	$241,793
MANUFACTURED				
Belting	.....	$9,267	.....	$182,797
Hose	.....	10,133	.....	143,633
Packing	.....	4,548	.....	40,278
Boots and shoes.....*pairs*	4,229	8,879	59,233	101,909
Clothing, including waterproofed	.....	11,819	.....	188,899
Gloves	.....	1,961	.....	16,539
Hot water bottles	.....	2,316	.....	17,030
Tires, solid.....*number*	55	3,591	585	32,913
Tires, pneumatic.....*number*	1,099	14,036	33,683	250,842
Tires, tubes.....*number*	1,510	4,118	14,192	36,745
Elastic, round or flat	.....	11,785	.....	154,491
Mats and matting	.....	2,157	.....	37,599
Cement	.....	3,121	.....	75,201
Golf balls.....*dozen*	767	2,466	35,243	142,901
Heels, rubber.....*pairs*	28,957	1,823	226,950	13,653
Other rubber manufactures	.....	86,185	.....	1,048,246
Totals	.....	$178,205	.....	$2,483,676
Totals, rubber imports	.....	$2,178,097	.....	$20,527,030

Exports of Domestic and Foreign Rubber Goods

	January, 1927		Ten Months Ended January, 1927	
UNMANUFACTURED	Produce of Canada Value	Re-exports of Foreign Goods Value	Produce of Canada Value	Re-exports of Foreign Goods Value
Crude and waste rubber	$23,655	.....	$249,245	.....
Totals	$23,655	.....	$249,245	.....
MANUFACTURED				
Belting	$25,086	.....	$460,415	.....
Canvas shoes with rubber soles	236,342	.....	3,186,728	.....
Boots and shoes	220,860	.....	2,356,858	.....
Clothing, including waterproofed	1,303	.....	20,905	.....
Hose	21,346	.....	234,691	.....
Tires, casings	1,298,489	.....	11,897,104	.....
Inner tubes	228,203	.....	2,037,146	.....
Solid	27,593	.....	243,974	.....
Other rubber manufactures	55,141	$3,108	508,947	$96,017
Totals	$2,114,363	$3,108	$20,946,768	$96,017
Totals, rubber exports	$2,138,018	$3,108	$21,196,013	$96,017

Landings, Deliveries and Stocks in London and Liverpool as Returned by the Warehouses and Wharves During the Month of February, 1927

	Landed for February	Delivered for February	Stocks, February 28		
LONDON	Tons	Tons	1927 Tons	1926 Tons	1925 Tons
Plantation	9,446	5,509	58,622	9,863	23,248
Other grades	5	6	126	92	84
LIVERPOOL					
Plantation	†684	†411	†2,344	†650	†2,112
Total tons, London and Liverpool	10,135	5,926	61,092	10,605	25,444

†Official returns from the six recognized public warehouses.

Crude Rubber Arrivals at New York as Reported by Importers

Plantations

CASES

MARCH 14. By "Fairfield City," Far East.
Haldane Bierrie & Co., Inc. 135

MARCH 15. By "American Farmer," London.
General Rubber Co. 80

MARCH 15. By "Pres. Taft," Far East.
Littlejohn & Co., Inc. †400

MARCH 15. By "Minnekahda," London.
General Rubber Co. 93

MARCH 19. By "Colorado," Far East.
Poel & Kelly, Inc. *120

MARCH 19. By "Mahout," Far East.
Charles T. Wilson Co., Inc. 154

MARCH 22. By "American Banker," Far East.
H. Muehlstein & Co., Inc. 165
Charles T. Wilson Co., Inc. 608

MARCH 22. By "Celtic," Liverpool.
Baird Rubber & Trading Co., Inc. 54

MARCH 22. By "Noordam," Rotterdam.
Haldane Bierrie & Co., Inc. 68
The Meyer & Brown Corporation....pkgs. 73

MARCH 23. By "Ausonia," London.
Baird Rubber & Trading Co., Inc. 150
Littlejohn & Co., Inc. 100
H. Muehlstein & Co., Inc. 161

MARCH 23. By "Haleric," Colombo.
H. A. Astlett & Co. 400
Baird Rubber & Trading Co., Inc. 250
General Rubber Co. 470
Haldane Bierrie & Co., Inc. 480
Littlejohn & Co., Inc. 1,638
The Meyer & Brown Corporation....pkgs. 400
Poel & Kelly, Inc. 300
Charles T. Wilson Co., Inc. 175

MARCH 23. By "Hamburg," Hamburg.
Baird Rubber & Trading Co., Inc. 166

MARCH 23. By "Mississippi," London.
Hood Rubber Co. *28
Littlejohn & Co., Inc. 46

MARCH 24. By "Karimata," Sumatra.
H. A. Astlett & Co. 391
Baird Rubber & Trading Co., Inc. 308
General Rubber Co. 3,467
Haldane Bierrie & Co., Inc. 499
Littlejohn & Co., Inc. 1,157
Meyer & Brown, Inc.....pkgs. 355
The Meyer & Brown Corporation....pkgs. 170
H. Muehlstein & Co., Inc. 541
Poel & Kelly, Inc. 628
Raw Products Co. 8
Rogers Brown & Crocker Bros., Inc. 171
Chas. T. Wilson Co., Inc. 168

MARCH 25. By "City of Bedford," Far East.
H. A. Astlett & Co. 437
Baird Rubber & Trading Co., Inc. 964
General Rubber Co. 4,303
Haldane Bierrie & Co., Inc. 700
Hood Rubber Co. *150
Littlejohn & Co., Inc. 3,819
Meyer & Brown, Inc.....pkgs. 402
The Meyer & Brown Corporation...pkgs. 570
H. Muehlstein & Co., Inc. 61
Poel & Kelly, Inc. 475
Raw Products Co. 14
Rogers Brown & Crocker Bros., Inc. 215
Charles T. Wilson Co., Inc. 350

MARCH 25. By "Pres. Harrison," Far East.
H. A. Astlett & Co. 900
Baird Rubber & Trading Co., Inc. 150
Paul Bertuch & Co., Inc. 200
Paul Bertuch & Co., Inc. *50
General Rubber Co. 1,613
Haldane Bierrie & Co., Inc. 250
Littlejohn & Co., Inc. 1,835
The Meyer & Brown Corporation...pkgs. 980
H. Muehlstein & Co., Inc. 215
Poel & Kelly, Inc. 630
Poel & Kelly, Inc. *50
Charles T. Wilson & Co., Inc. 33

* Arrived at Boston.

† Arrived at Pacific Coast.

CASES

MARCH 26. By "Gaasterdyk," Rotterdam.
General Rubber Co. 67
The Meyer & Brown Corporation...pkgs. 48

MARCH 28. By "Pres. Jefferson," Far East.
H. A. Astlett & Co. †250
Baird Rubber & Trading Co., Inc. †50
Poel & Kelly, Inc. †250
Rogers Brown & Crocker Bros., Inc. †115

MARCH 29. By "London Mariner," London.
Baird Rubber & Trading Co., Inc. 244
Charles T. Wilson Co., Inc. 349

MARCH 30. By "American Shipper," London.
Rogers Brown & Crocker Bros., Inc. 169

MARCH 31. By "Norwegian," London.
General Rubber Co. 100

MARCH 31. By "Oanfa," Far East.
H. A. Astlett & Co. 2,080
Baird Rubber & Trading Co., Inc. 650
General Rubber Co. 6,014
Haldane Bierrie & Co., Inc. 250
Littlejohn & Co., Inc. 3,357
Meyer & Brown, Inc.....pkgs. 100
The Meyer & Brown Corporation....pkgs. 759
H. Muehlstein & Co., Inc. 740
Poel & Kelly, Inc. 350
Rogers Brown & Crocker Bros., Inc. 374
Charles T. Wilson Co., Inc. 350

APRIL 1. By "Cyclops," Far East.
H. A. Astlett & Co. 2,450
Baird Rubber & Trading Co., Inc. 669
General Rubber Co. 3,385
Haldane Bierrie & Co., Inc. 450
Littlejohn & Co., Inc. 2,629
Meyer & Brown, Inc.....pkgs. 23
The Meyer & Brown Corporation...pkgs. 515
Poel & Kelly, Inc. 1,535
Raw Products Co. 146
Charles T. Wilson Co., Inc. 420

APRIL 1. By "Silveray," Far East.
H. A. Astlett & Co. 1,095
General Rubber Co. 3,638
Haldane Bierrie & Co., Inc. 143
Hood Rubber Co. *102
Littlejohn & Co., Inc. 4,039
The Meyer & Brown Corporation...pkgs. 540
H. Muehlstein & Co., Inc. 566
Poel & Kelly, Inc. 157
Rogers Brown & Crocker Bros., Inc. 210
Charles T. Wilson Co., Inc. 350

APRIL 2. By "Steel Mariner," Antwerp.
Bowring & Co. 56

APRIL 4. By "Chinese Prince," Far East.
H. A. Astlett & Co. 470
Baird Rubber & Trading Co., Inc. 1,738
General Rubber Co. 3,666
Haldane Bierrie & Co., Inc. *447
Hood Rubber Co. *134
Littlejohn & Co., Inc. 5,589
Meyer & Brown, Inc.....pkgs. 100
The Meyer & Brown Corporation...pkgs. 1,024
H. Muehlstein & Co., Inc. 557
Poel & Kelly, Inc. 156
Rogers Brown & Crocker Bros., Inc. 120
Charles T. Wilson Co., Inc. 615

APRIL 4. By "Minnewaska," Europe.
General Rubber Co. 927
Littlejohn & Co., Inc. 90
Raw Products Co. 824
Charles T. Wilson Co., Inc. 505

APRIL 5. By "Aurania," Europe.
General Rubber Co. 237
Raw Products Co. 195
Rogers Brown & Crocker Bros., Inc. 144

APRIL 6. By "Comeric," Far East.
Littlejohn & Co., Inc. 326
The Meyer & Brown Corporation...pkgs. 112
Charles T. Wilson Co., Inc. 149

APRIL 7. By "Ascania," Europe.
General Rubber Co. 50
Littlejohn & Co., Inc. 100
H. Muehlstein & Co., Inc. 162

CASES

APRIL 7. By "Pres. Monroe," Far East.
H. A. Astlett & Co. 2,082
Baird Rubber & Trading Co., Inc. 1,508
Paul Bertuch & Co., Inc. 100
General Rubber Co. 2,213
Haldane Bierrie & Co., Inc. 1,230
Hood Rubber Co. *398
Littlejohn & Co., Inc. 2,687
Meyer & Brown, Inc.....pkgs. 275
The Meyer & Brown Corporation...pkgs. 410
H. Muehlstein & Co., Inc. 801
Poel & Kelly, Inc. 1,250
Rogers Brown & Crocker Bros., Inc. 1,333
Rogers Brown & Crocker Bros., Inc. *50
Charles T. Wilson Co., Inc. 311

APRIL 8. By "De Grasse," Europe.
General Rubber Co. 21

APRIL 8. By "Robert Dollar," Far East.
H. A. Astlett & Co. †150

APRIL 8. By "Stadadyk," Rotterdam.
Raw Products Co. 147
Charles T. Wilson Co., Inc. 230

APRIL 10. By "Pres. Grant," Far East.
Poel & Kelly, Inc. †600
Rogers Brown & Crocker Bros., Inc. †112

APRIL 11. By "Nieuw Amsterdam," Rotterdam.
General Rubber Co. 146
Raw Products Co. 57

APRIL 11. By "Steel Traveler," Far East.
H. A. Astlett & Co. 1,590
Baird Rubber & Trading Co., Inc. 150
Paul Bertuch & Co., Inc. 250
General Rubber Co. 7,732
Haldane Bierrie & Co., Inc. 50
Littlejohn & Co., Inc. 2,181
The Meyer & Brown Corporation...pkgs. 210
H. Muehlstein & Co., Inc. 195
Poel & Kelly, Inc. 285
Raw Products Co. 345
Rogers Brown & Crocker Bros., Inc. 150
Charles T. Wilson Co., Inc. 1,173

APRIL 12. By "American Merchant," Europe.
General Rubber Co. 1,012

APRIL 12. By "Dacre Castle," Far East.
H. A. Astlett & Co. 2,715
Baird Rubber & Trading Co., Inc. 951
General Rubber Co. 10,780
Haldane Bierrie & Co., Inc. 453
Hood Rubber Co. *228
Littlejohn & Co., Inc. 4,047
Meyer & Brown, Inc.....pkgs. 50
The Meyer & Brown Corporation...pkgs. 750
H. Muehlstein & Co., Inc. 903
Poel & Kelly, Inc. 1,944
Raw Products Co. 540
Rogers Brown & Crocker Bros., Inc. 401
Charles T. Wilson Co., Inc. 1,969

APRIL 12. By "Minnekahda," London.
Baird Rubber & Trading Co., Inc. 107
General Rubber Co. 1,644
Littlejohn & Co., Inc. 282
Charles T. Wilson Co., Inc. 1,606

APRIL 12. By "Scythia," London.
Charles T. Wilson Co., Inc. 122

APRIL 13. By "Kosmo," Far East.
General Rubber Co. 21

APRIL 14. By "Veendyk," Far East.
H. A. Astlett & Co. 1,480
Baird Rubber & Trading Co., Inc. 500
General Rubber Co. 8,294
Haldane Bierrie & Co., Inc. 875
Hood Rubber Co. *136
Littlejohn & Co., Inc. 2,010
The Meyer & Brown Corporation...pkgs. 750
H. Muehlstein & Co., Inc. 150
Poel & Kelly, Inc. 554
Raw Products Co. 261
Rogers Brown & Crocker Bros., Inc. 132
Charles T. Wilson Co., Inc. 659

APRIL 15. By "City of Johannesburg," Far East.
Haldane Bierrie & Co., Inc. 853
Hood Rubber Co. *100
Raw Products Co. 75
Rogers Brown & Crocker Bros., Inc. 1,250

Manicobas

MARCH 30. By "Dunrobin," Brazil.
J. H. Rossbach & Bros., Inc.....bales 187

APRIL 1. By "Brazilian Prince," Brazil.
J. H. Rossbach & Bros., Inc.....bales 51

APRIL 8. By "Bonheur," Brazil.
J. H. Rossbach & Bros., Inc.....bales 71

Rubber Latex

	Gallons
MARCH 23. By "Karimata," Far East.	
General Rubber Co.	22,973
MARCH 25. By "City of Bedford," Far East.	
Littlejohn & Co., Inc.	2,002
APRIL 1. By "Silveray," Far East.	
General Rubber Co.	134,619
APRIL 12. By "Dacre Castle," Far East.	
General Rubber Co.	91,026
APRIL 13. By "Veendyk," Far East.	
General Rubber Co.	38,716

Guayule

	Cases
MARCH 15. By "Railroad," Mexico.	
Continental Rubber Co. of New York	‡3,120
MARCH 30. By "Agwidale, Mexico.	
Continental Rubber Co. of New York	1,120

‡ Arrived at Laredo, Texas.

	Cases
APRIL 1. By "Mexico," Mexico.	
Continental Rubber Co. of New York	560
APRIL 6. By "Railroad," Mexico.	
Continental Rubber Co. of New York	‡1,060
APRIL 10. By "Canto," Mexico.	
Continental Rubber Co. of New York	1,120
APRIL 12. By "Railroad," Mexico.	
Continental Rubber Co. of New York	‡560

Balata

	Cases
MARCH 18. By "Haiti," Surinam.	
Middleton & Co., Ltd. ....bales	33
MARCH 28. By "Dunrobin," Para.	
H. A. Astlett & Co.	36
Paul Bertuch & Co., Inc.	42
MARCH 31. By "Sheridan," Manaos.	
H. A. Astlett & Co.	33
General Rubber Co.	8
APRIL 11. By "Justin," Manaos.	
H. A. Astlett & Co.	560
Paul Bertuch & Co., Inc.	32

Africans

	Cases
MARCH 16. By "La Bourdonnais," Bordeaux.	
Littlejohn & Co., Inc.	721
MARCH 26. By "Burgerdyk," Europe.	
Littlejohn & Co., Inc.	220
MARCH 26. By "Higho," Africa.	
Littlejohn & Co., Inc.	1,228
MARCH 29. By "Suffren," Europe.	
Littlejohn & Co., Inc.	156
APRIL 1. By "Collamer," Bordeaux.	
Baird Rubber & Trading Co., Inc.	51
APRIL 2. By "Texas Maru," Europe.	
Littlejohn & Co., Inc.	448
APRIL 4. By "Albert Ballin," Europe.	
Littlejohn & Co., Inc.	511
APRIL 5. By "Aurania," Europe.	
Littlejohn & Co., Inc.	101
APRIL 13. By "Roussillon," Europe.	
Littlejohn & Co., Inc.	1,796

Paras and Caucho

	Fine Cases	Medium Cases	Coarse Cases	Caucho Cases	Cametá Cases
MARCH 15. By "Pan America," Para.					
Paul Bertuch & Co., Inc.	67	...	...	...	...
MARCH 28. By "Dunrobin," Para.					
H. A. Astlett & Co.	101	...	260	6	...
Paul Bertuch & Co., Inc.	452	...	90	61	...
Paul Bertuch & Co., Inc. ....*bales*	...	...	...	329	...
General Rubber Co.	169	37	371	233	17
Littlejohn & Co., Inc.	995	34	317	76	...
The Meyer & Brown Corp. ...*pkgs.*	430	31	...	34	...
MARCH 31. By "Sheridan," Manaos.					
H. A. Astlett & Co.	224	...	79	33	...
Paul Bertuch & Co., Inc.	188	...	...	9	...
General Rubber Co.	666	59	371	1,071	...
Littlejohn & Co., Inc.	672	50	421	199	...
The Meyer & Brown Corp. ...*pkgs.*	991	68	...	...	...
APRIL 11. By "Justin," Manaos.					
H. A. Astlett & Co.	254	23	166	80	...
Paul Bertuch & Co., Inc.	350	...	...	195	...
General Rubber Co.	377	36	320	77	17

United States Crude and Waste Rubber Imports for 1927 (By Months)

	Plantations	Paras	Africans	Centrals	Guayule	Manicobas and Matto Grosso	Total 1927	Total 1926	Balata	Miscellaneous	Waste
January ....*tons*	42,646	2,378	269	299	144	....	45,736	38,697	106	1,508	447
February	25,326	1,668	213	203	190	....	27,600	34,067	119	935	953
March	33,114	1,176	206	253	329	....	35,078	42,677	82	674	531
Total, three months, 1927..*tons*	101,086	5,222	688	971	672	....	108,639	.....	307	3,117	1,931
Total, three months, 1926..*tons*	108,381	3,830	1,352	1,021	839	18	.....	115,441	143	2,599	2,280

Compiled from statistics supplied by the Rubber Association of America, Inc.

PRELIMINARY SURVEY OF TIRE DEALERS' STOCKS

The sixth semi-annual survey of the stocks of automobile tires and inner tubes held by dealers in the United States is being prepared by the Department of Commerce, and preliminary figures, subject to revision, are now being issued. It has been estimated that for April 1, 1927, the average number of pneumatic casings per dealer was 68.8, as compared with 63.9 for April 1, 1926, and 62.2 on April 1, 1925. Stocks of balloon casings, figured separately, average 33.8 per dealer reporting, an increase for April 1, 1927, of about 50 per cent over the 1926 average of 21.9, the 1925 figure being 14.8. Inner tubes held by dealers average 114.7, the 1926 figure being 119.6 and that for 1925, 102.1. Stocks for 1927 of solid and cushion tires average 24.4 per dealer, the 1926 and 1925 figures being 26.9 and 20.1 respectively.

The total number of casings, including balloons, reported by the 25,867 dealers contributing to the survey amounts to 1,780,034 for April 1, 1927, as against the 2,056,472 casings reported by 32,184 dealers on April 1, 1926. The 1927 figure for balloon casings alone, as reported by 17,472 dealers, was 591,419, as compared with 399,808, as given by 18,284 dealers for 1926. The total for inner tubes, as reported for April 1, 1927, by 25,452 dealers, was 2,920,584, as against 3,839,799, reported by 32,112 dealers for April 1, 1926. Stocks of solid and cushion tires, in the hands of 1,274 dealers, totaled 31,083 for April 1, 1927, as against the 1926 figure of 50,230 tires, reported by 1,866 dealers. Of the 25,867 dealers supplying data for this survey, 7,402 reported carrying a stock of from 10 to 25 casings; 5,878 estimating a volume of from 26 to 50 casings. Only 125 dealers reported a stock of more than 1,000 casings.

IMPORTS INTO THE UNITED STATES OF GUAYULE TOTALED FOR THE twelve months of 1926, 9,643,131 pounds, value $2,562,096.

STATEMENT OF THE INDIA RUBBER WORLD

Statement of the ownership, management, circulation, etc., required by the Act of Congress of August 24, 1912, of THE INDIA RUBBER WORLD, published monthly at New York, N. Y., for April 1, 1927.

State of New York } ss.:
County of New York }

Before me, a Notary Public in and for the State and county aforesaid, personally appeared E. M. Hoag, who, having been duly sworn according to law, deposes and says that she is the business manager of the THE INDIA RUBBER WORLD and that the following is, to the best of her knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, The India Rubber Publishing Co., 420 Lexington avenue, New York, N. Y.; Editor, Henry C. Pearson, 420 Lexington avenue, New York, N. Y.; Managing Editor, William M. Morse, 420 Lexington avenue, New York, N. Y. Business Manager, E. M. Hoag, 420 Lexington avenue, New York, N. Y.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) The India Rubber Publishing Co., Henry C. Pearson; Edward Lyman Bill, Inc., Caroline L. Bill, Edward Lyman Bill, Raymond Bill, Randolph Brown, H. R. Brown, Carleton Chace, Wm. A. Low, Lee Robinson, J. B. Spillane, B. B. Wilson—all located at 420 Lexington avenue, New York, N. Y.; Edward Van Harlingen, 209 South State street, Chicago, Ill.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by her.

E. M. HOAG, Business Manager.

Sworn to and subscribed before me this 21st day of March, 1927.

[SEAL] HARRY HOAG, Notary Public.

N. Y. County Clerk's No. 353. N. Y. County, Register's No. 9195.

(My commission expires March 30, 1929.)

United States Rubber Statistics

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	January, 1927		Six Months Ended December, 1926	
UNMANUFACTURED—*Free*	Pounds	Value	Pounds	Value
Crude rubber	97,082,264	$36,753,719	463,043,697	$183,829,525
Balata	122,608	42,314	442,749	188,177
Jelutong or Pontianak	1,915,487	64,988	8,214,716	1,593,942
Gutta percha	219,295	56,265	1,694,743	341,246
Guayule	655,100	154,533	4,077,845	1,001,559
Rubber scrap	1,907,893	80,668	12,503,319	553,452
Totals	101,902,647	$37,152,487	489,977,069	$187,507,901
Chicle—*dutiable*	1,344,651	$705,417	4,406,691	$2,233,305
MANUFACTURED—*dutiable*				
Rubber belting	69,957	$42,820	336,499	$217,707
Rubber tires	148	4,347	14,415	119,788
Other manufactures of rubber	.....	112,404	.....	674,555
Totals	70,105	$159,571	350,914	$1,012,050

EXPORTS OF FOREIGN MERCHANDISE

RUBBER AND MANUFACTURES				
Crude rubber	3,417,303	$1,444,734	20,297,996	$9,172,379
Balata	10,714	4,881	82,070	37,736
Gutta percha and rubber substitutes and scrap	216	80	56,870	1,763
Rubber manufactures	.....	2,448	.....	109,712
Totals	3,428,233	$1,452,143	20,436,936	$9,321,590

EXPORTS OF DOMESTIC MERCHANDISE

MANUFACTURED				
India Rubber				
Reclaimed	1,625,649	$199,740	6,118,187	$685,549
Scrap and old	2,178,958	118,620	16,460,518	1,065,747
Footwear				
Boots—*pairs*	51,868	131,678	753,847	1,665,790
Shoes—*pairs*	77,239	66,082	994,715	1,020,713
Canvas shoes with rubber soles—*pairs*	333,751	250,997	2,834,545	1,902,235
Rubber water bottles and fountain syringes—*number*	31,095	18,392	192,407	138,837
Rubber gloves—*doz. pairs*	5,092	13,726	36,636	120,068
Other druggists' rubber sundries	.....	37,859	.....	207,241
Bathing caps—*doz.*	5,739	17,429	38,212	90,386
Hard rubber goods				
Electrical hard rubber goods	169,859	42,777	496,442	143,389
Other hard rubber goods	.....	20,227	.....	197,458
Tires				
Casings, automobile—*number*	192,959	2,436,998	764,807	11,277,400
Tubes, automobile—*number*	117,686	263,729	545,059	1,363,467
Other casings and tubes—*number*	1,849	8,712	27,025	73,988
Solid tires for automobiles and motor trucks—*number*	10,462	280,667	41,602	1,409,863
Others	64,288	19,909	773,171	232,040
Tire accessories	.....	97,489	.....	783,280
Rubber and friction tape	101,734	32,372	624,758	200,276
Belting	411,037	215,519	2,144,693	1,285,464
Hose	596,832	247,458	2,856,974	1,161,479
Packing	195,986	96,508	1,090,663	548,654
Soles and heels	307,724	110,254	2,309,134	723,221
Thread	136,020	173,819	573,711	752,290
Rubber bands and erasers	70,855	53,796	386,429	307,320
Other rubber manufactures	.....	189,411	.....	1,185,140
Totals	.....	$5,144,168	.....	$28,541,295
Rubber toys, balls and balloons	.....	.....	.....	$441,581
Rubber toys and balls	.....	$13,032	.....	.....
Rubber balloons—*gross*	24,539	$33,946	.....	.....

Imports of Crude Rubber Into the United States by Customs Districts

	*February, 1927		Two Months Ended *February, 1927	
	Pounds	Value	Pounds	Value
Massachusetts	4,232,765	$1,550,248	10,444,674	$3,790,766
St. Lawrence	6,864	2,265	6,864	2,265
New York	55,767,192	20,294,064	143,527,918	53,627,577
Maryland	1,723,371	609,276	2,237,686	809,875
New Orleans	2,057	227	2,057	227
Los Angeles	1,501,190	566,414	3,204,942	1,189,578
San Francisco	62,440	21,796	769,202	302,026
Oregon	33,600	10,351	218,400	86,046
Colorado	145,600	55,616	145,600	55,616
Totals	63,475,079	$23,110,257	160,557,343	$59,863,976

*Including Latex Dry Rubber Content.

EL POPO, A TIRE FACTORY IN MEXICO CITY, MEXICO, IS OPERATING with one eight-hour shift, according to the Department of Commerce, and is turning out 100 tires and between 200 and 300 inner tubes daily.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished those who read them. The Editor is therefore glad to have those interested communicate with him.

NUMBER	INQUIRY
939	Manufacturers of potters' rubbers.
940	Source of supply for compounded but uncured rubber.
941	Manufacturers of heavy rubber clothing.
942	Makers of Gold Seal rubber boots.
943	Chemistry course.
944	Firm to mold rubber sole on canvas upper.

Foreign Trade Information

For further information concerning the inquiries listed below, address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

NUMBER	COUNTRY AND COMMODITY	PURCHASE OR AGENCY
24,574	Brazil. Rubber goods	Agency
24,579	Belgium. Chemicals for rubber vulcanization and manufacturing	Agency
24,627	Australia. Garden hose	Agency
24,628	Canada. Druggists' rubber sundries	Agency
24,629	Brazil. Balloons and other rubber novelties	Agency
24,630	Porto Rico. Druggists' rubber sundries	Agency
24,631	Angola. Automobile tires	Agency
24,632	Germany. Automobile and truck tires	Agency
24,646	Australia. Surgical rubber goods	Agency
24,651	Argentina. Automobile tires and tubes	Agency
24,683	Germany. Tires	Purchase
24,688	Austria. Rubber footwear, and erasers	Agency
24,693	Germany. Balloon tires	Agency
24,720	Australia. Rubber packings	Purchase or agency
24,722	New Zealand. Druggists' rubber sundries	Agency
24,731	Germany. Bicycle tires and accessories	Purchase
24,762	Esthonia. Automobile and bicycle tires	Agency
24,789	Germany. Technical rubber goods	Agency
24,812	Germany. Crepe rubber for shoe soles, and crude rubber	Purchase and agency
24,829	Mexico. Rubber heels and soles	Agency
24,857	Czechoslovakia. Rubber sheets for offset printing	Agency
24,860	Switzerland. Automobile tires	Sole agency
24,899	Philippines. Rubber shoes	Purchase or agency
24,943	Scotland. Crude rubber	Agency
24,972	Austria. Rubber footwear	Purchase or agency
24,973	Chile. Heels and soles	Agency
24,974	Germany. Dry rubber cement, in sheets	Purchase
24,976	Germany. Tennis balls	Purchase and agency
24,977	Germany. Rubber goods	Agency

Foreign Trade Circulars

Special circulars containing foreign rubber trade information are now being published by the Rubber Division, Bureau of Foreign and Domestic Commerce, Washington, D. C. The publications which give details of the rubber industry in some one country are marked with an asterisk.

NUMBER	SPECIAL CIRCULAR
1445	"Tire Exporters' Weekly News Letter."
*1446	"February Imports of Golf Balls Into the United States."
*1447	"February Imports of Rubber Tires Into the United States."
*1448	"French Tire Exports During the Month of January, 1927."
1451	"Rubber Crop and Exports (Manáos) During 1926."
1452	"Tire Exporters' Weekly News Letter."
*1454	"Canadian Tire Exports During February, 1927."
1455	"Crude Rubber News Letter."
*1456	"Developments in Swedish Tire Market."
1457	"Mechanical Rubber Goods Exporters' Monthly News Letter."
1459	"Tire Exporters' Weekly News Letter."
1461	"Crude Rubber News Letter."
*1462	"British Exports of Automobile Casings During February, 1927."
*1464	"Preliminary Statistics of United States Crude Rubber Imports—March, 1927."
1465	"Tire Exporters' Weekly News Letter."
*1467	"Italian Rubber Industry."
*1468	"French Tire Exports During Month of February, 1927."
*1470	"Preliminary Statistics of Dealers' Stocks of Automobile Tires, April 1, 1927."
1472	"Comparative Casing Exports from United States, Canada, United Kingdom, France, Italy, Germany and Belgium During 1926."
1474	"Comparative Exports of Solid Tires from United States, Canada, the United Kingdom, Germany, and Italy During 1926."

CHICLE IMPORTS INTO THE UNITED STATES DURING THE YEAR 1926 totaled 12,381,075 pounds, value $6,204,264.